







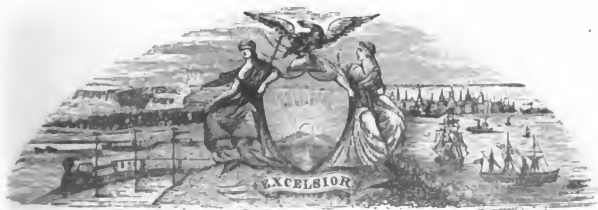
New York (state). Legislature Assembly 83d sess.
DOCUMENTS

OF THE

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EIGHTY-THIRD SESSION.—1860.

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TRANSACTIONS
OF THE
N. Y. State Agricultural Society,
WITH AN
ABSTRACT OF THE PROCEEDINGS
OF THE
COUNTY AGRICULTURAL SOCIETIES.

VOLUME XIX.—1859.

ALBANY:
CHARLES VAN BENTHUYSEN.
1860.

NOTICE.

The Nineteenth Volume of the Transactions of the New York State Agricultural Society, is presented to the farmers of New York. There are many very valuable papers in this volume entitled to the careful consideration of the farmers of our country. It has constantly been our aim in the preparation of the reports of the Society, to place before the farmers such articles as will enable them to advance in their profession, and increase the returns of their farm operations. We shall be disappointed if this report does not accomplish these objects.

We are pleased to be enabled to present another of our county surveys, and one of the most important and valuable ones which has been published. The county of Onondaga, one of the richest farming districts in the State, with a great variety of soils, has found, in the Hon. George Geddes, one capable of illustrating all its capabilities; and the farmers in the State will here find materials which will enable them far more successfully to carry on their operations. The Society is greatly indebted to Mr. Geddes for the faithful manner in which he has executed the work entrusted to him, and he will have the satisfaction of learning, as his survey is made known to the farmers, that he has accomplished a noble work for our State. A continuation of the valuable experiments with different manures on permanent meadow lands, by Professors Lawes and Gilbert, will be found even more interesting than that in the last report of the Society. We have been gratified at the numerous letters received, thanking us for having given the first report, and we shall confidently expect that the two reports now given will be found of permanent and enduring value to our farmers in the improvement of their meadow lands.

A very excellent article is given on the so called barren lands of Long Island, which will well repay a careful perusal, and will, we trust, lead to careful experiments, by which the large tracts of land uncultivated may soon be converted into fertile and flourishing fields.

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The farm reports, and the reports on dairies, will be found of no little importance. It is a matter of congratulation, that so much interest is awakened throughout the State in investigations as to the best means of increasing the products of our State, and it will be found on examining the various papers in this report, that measures are being adopted to enable the farmer in every department of his work, to make advances.

A valuable article on a butter dairy farm and its management, by a Delaware county dairyman, is one of the best we have seen, and will greatly aid the dairyman in every department of his work.

We regret that, owing to a severe illness of Dr. Fitch, the sixth report of his on Entomology, was not in readiness for this report. It will be given with the seventh, in the report of 1860. We give Dr. Fitch's valuable address on the "*Curculio*," which we believe is the best description of that insect, and the method of mitigating its ravages, yet published. Also an essay on the insects injurious to crops, which will be of interest to all.

The able addresses, by Hon. John A. Dix, at the annual exhibition, and that of the Hon. A. B. Conger, at the close of his term of office, will undoubtedly receive that careful consideration, to which they are so justly entitled.

The report on European Agriculture, by the Treasurer, will be found a very interesting and valuable article.

The *cattle disease*, which has excited great interest in a neighboring State, has induced the Executive Committee to investigate the disease, and valuable papers relating to it will be found in this report.

We have been obliged, from the abundance of material furnished, to condense very much many of the reports presented. We trust this will be a sufficient apology for so doing.

Owing to the use of smaller type in this volume, it has been brought in smaller compass than some of the preceding ones, which will, we presume, be acceptable to most of our readers.

B. P. JOHNSON.

AGRICULTURAL ROOMS, *March*, 1860.

CONSTITUTION

OF NEW YORK STATE AGRICULTURAL SOCIETY.

The style of this Society shall be "The New York State Agricultural Society." Its objects shall be to improve the condition of Agriculture, Horticulture, and the Household Arts.

SEC. 1. The Society shall consist of such citizens of the State as shall signify in writing, their wish to become members, and shall pay on subscribing not less than one dollar, and annually thereafter one dollar, and also of Honorary and Corresponding members.

The Presidents of County Agricultural Societies, or a delegate from each, shall ex-officio be members of this Society.

The payment of Ten dollars or more shall constitute a member for life, and shall exempt the donor from annual contributions.

SEC. 2. The officers of the Society shall consist of a President, eight Vice-Presidents, one to be located in each Judicial District; a Recording Secretary, a Corresponding Secretary, a Treasurer, an Executive Committee, to consist of the officers above named, and five additional members, and five of the Ex-Presidents shall be ex-officio members of the Executive Committee, and these five shall consist of the five Ex-Presidents whose term of office has last expired, of whom three shall constitute a quorum; and that the Ex-Presidents of the Society, not members of the Executive Committee, shall constitute a Board of Counsellors, to which may be referred, for consultation and advice, all questions that may from time to time arise, and in the decision of which the Society may in any manner be interested; and a General Committee, the members of which shall be located in the several counties, and be equal to the representatives in the House of Assembly.

SEC. 3. The Recording Secretary shall keep the minutes of the Society. The Corresponding Secretary shall carry on the correspondence with other Societies, with individuals, and with the general committee, in the furtherance of the objects of the Society.

The Treasurer shall keep the funds of the Society, and disburse them on the order of the President or a Vice-President, countersigned by the Recording Secretary, and shall make a report of the receipts and expenditures at the annual meeting in February.

The Executive Committee shall take charge of and distribute or preserve all seeds, plants, books, models, &c., which may be transmitted to the Society; and shall have also the charge of all communications designed or calculated for publication, and so far as they may deem expedient, shall collect, arrange and publish the same in such manner and form as they shall deem best calculated to promote the objects of the Society.

The General Committee are charged with the interests of the Society in counties in which they shall respectively reside, and will constitute a medium of communication between the Executive Committee and the remote members of the Society.

SEC. 4. There shall be an annual meeting of the Society on the second Wednesday of February, in the city of Albany, at which time all the officers shall be elected by a plurality of votes and by ballot, with the exception of the General Committee for the counties, which may be appointed by the Executive Committee, who shall have power to fill any vacancies which may occur in the officers of the Society during the year. Extra meetings may be convoked by the Executive Committee. Fifteen members shall be a quorum for the transaction of business.

SEC. 5. The Society shall hold an Annual Cattle Show and Fair at such time and place as shall be designated by the Executive Committee.

SEC. 6. This Constitution may be amended by a vote of two-thirds of the members attending any annual meeting, upon one year's previous notice in writing.

STATE AGRICULTURAL ROOMS, }
February, 1860. }

I certify that the above is a true copy of the Constitution of the New York State Agricultural Society.

B. P. JOHNSON, *Cor. Secretary.*

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Annual meeting, second Wednesday in February.

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State Agricultural Rooms and Museum, State buildings, State-street, corner Lodge.

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STATE OF NEW YORK.

No. 181.

IN ASSEMBLY, APRIL 3, 1860.

ANNUAL REPORT

Of the New York State Agricultural Society.

AGRICULTURAL ROOMS, }
ALBANY, April 3, 1860. }

To the Hon. DE WITT C. LITTLEJOHN,

Speaker of the Assembly:

Pursuant to the acts of the Legislature for the promotion of agriculture, I present the annual report of the New York State Agricultural Society, with the proceedings of the Executive Committee, and abstracts of the reports of County Societies.

I am, very respectfully, yours,

B. P. JOHNSON,

Corresponding Secretary.

TO THE
LIBRARY

TRANSACTIONS

OF THE

New York State Agricultural Society.

Report of the Executive Committee for 1859.

TO THE LEGISLATURE OF THE STATE OF NEW YORK:

The Executive Committee of the New York State Agricultural Society, in submitting their proceedings for the year 1859, beg leave most respectfully to report:

That the year has been one of unusual interest, so far as the exhibitions of State, county and town organizations are concerned. All of these indicate an improvement and advance in every department of agriculture, and, in many cases, of so marked a character as to attract the attention of every visitor at these exhibitions.

As regards the general condition of the agriculture of the State, it is proper to remark that the season has been one of unusual character. The ravages of frost have been very extensive, and the destruction of the grass crop, in many portions of the State, has very materially diminished the dairy products in quantity, and has very considerably affected the quality of the butter, in some portions of the season. The corn and buckwheat crops have also been seriously affected, as well as the spring crops generally, in many sections of the State; and, in many instances, these crops did not recover so as to give the usual return. But it is a fact of no little interest, that, so far as returns have been received, it is most evident that where attention has been given to drainage, thorough cultivation and manuring, the crops have suffered much less than in those cases where these precautions have been neglected.

The reports which have been received from various sections of the State, of which an abstract accompanies this report, most clearly corroborate this statement, and give most cheering assurances that our farmers are becoming aroused to the importance of a more systematic and thorough method of farming. These reports, from some of the most intelligent farmers in our State, are worthy of the attention of all, and are such as to be relied upon, giving the best evidence which can be had, of the actual progress now going on among the farmers of our State. We are gratified at the remarks of his Excellency the Governor, in relation to agriculture. He says: "The agricultural interest has been unusually prosperous, notwithstanding the partial drouth of summer, and early frosts of autumn. Lying, as this great interest does, as the base of our prosperity, you will not omit to extend to it all reasonable care and protection. Its security depends upon an equitable development of all the resources of the State, coupled with a just and economical administration of the government. The moderate annual appropriation for the encouragement of agriculture in the counties, and in support of the State Agricultural Society, has been fully returned to the treasury in the enhanced valuation of property, and an hundred fold in the general prosperity.

"The State, county and town societies, at once a source of usefulness and a satisfaction to the public, owe their prosperity, perhaps their existence, to the coöperation of the State. The more general participation in these organizations by many of the best members of the community, the increased interest felt in the pursuit, as manifest in the augmentation of the agricultural press, and the renewed desire for the highest institutions for agricultural instructions, are, in part, the fruits of this fostering care."

Agricultural College.—In the report made by our predecessors, allusion was made to the efforts making in our country for the establishment of agricultural institutions for the training of farmers' sons, and others, for the great work before them. It gives us great pleasure to be enabled to say, that there is every reason to believe that the New York State Agricultural College, at Ovid, Seneca county, will be in readiness to receive the first class of students during the present year. The trustees have published the course of studies to be pursued, and have placed at the head of the institution a gentleman well known to the farmers of New York, and in whom they can have confidence; and those to be associated with him, will, without doubt, be of such a character

and standing as to ensure an education that will be useful, and which, so far as instruction will do it, will prepare the students for the high position which they are destined to occupy. We trust the farmers of the State will not let this institution falter for want of funds to sustain it, and will use their best endeavors to extend its usefulness, and to give to it all that encouragement which it may need. His Excellency the Governor, thus notices this institution: "The New York State Agricultural College at Ovid, to which the State has loaned forty thousand dollars, for twenty-one years, without interest, is rapidly progressing toward completion and usefulness. The farm, of seven hundred acres, embraces a great variety of soils and characteristics which eminently adapt it to the purposes of experimental, as well as of productive farming. Two large buildings are now approaching completion. They are built in the best manner, heated by furnaces, lighted by gas and supplied throughout with water. It is the intention of the trustees to have them in readiness to receive one hundred and fifty students early next spring. When fully completed, there will be accommodations for three hundred students. Forty-one thousand dollars, besides donations of stock and implements, have been, thus far, contributed by the friends of the enterprise. The institution is under the direction and control of some of the best men in the State. Its usefulness will not fail to be enjoyed by the large class for whom it is designed."

Onondaga County Survey.—The survey of the county of Onondaga, to which allusion was made in the report of last year, has been completed by Hon. George Geddes, who was entrusted with its execution. We are happy at being enabled to say that it is, in its general character, all that was expected of the distinguished gentleman who has had it in charge, and will be of universal advantage to our State, and will aid the Society very materially in future surveys of other portions of the State. The county of Onondaga, rich in her resources, has never had them so developed as they are in this report. The varieties of soils, of which there are many, have never before been examined as they are in this survey; and the means best adapted to their advantageous culture and development, are most fully given.

Applications are before the Executive Committee for the surveys of other counties; and it is presumed that arrangements will be made for the continuance of the work, should the counties most important, as regards their location, be presented, with persons adapted to the work, to make the surveys. It is believed

that this is a most important feature in the work of the Society ; and it cannot be doubted that it will continue to progress, until the whole State is examined, and its resources fully developed.

The Wheat Crop.—The wheat crop of our State, the present year, has been one of the best for many years. The extent in culture was less than usual ; but in quality and in quantity per acre, the crop has seldom been excelled. There have been several reasons assigned for this, and among them one which has impressed itself upon our minds as not the least important. *Wheat has been sown on good soils, the ground well prepared and attended to, and the crops put in in season.* There has, from some cause, been far less ravages of the wheat midge, than for many years ; so much so, as to lead farmers to prepare more ground for wheat than last year. We are not prepared to say that the insect has left us. The result of the crop, the succeeding year, will probably afford us more light on the subject ; and it is hoped, the crop may prove equally as good as the last. It must, however, we think, be apparent, that in many instances, the same care has not been taken in the selection of the land and the preparation for the crop, as was general last year. Should this prove true, and a failure result, our farmers may, from the lesson, though an expensive one, learn, that to ensure good crops, it is all important that suitable soils be selected, suitable preparation for the reception of the seed, suitable manure for its enrichment, and sowing of the seed at the proper time, should each be carefully attended to.

The investigations in regard to the ravages of the wheat midge have been continued, and from the reports received, many important facts are given which will be found useful for the farmer.

The fact stated in our last report, "that where lands have been thoroughly underdrained (which required it), thus securing an earlier sowing, as well as ripening of the wheat, far less damages have been sustained from the ravages of the insect," have been fully sustained in the reports which have been made to the board. And although the best preparation of the lands may not of itself destroy the insect, it does place the land in a condition by which the crop attains a greater vigor and earlier maturity, and thereby escapes in no small degree, the destructive ravages of these enemies of the farmer. We cannot fail to urge upon the farmers of our State, that the best way to secure good crops is to prepare their lands in the very best manner which good husbandry suggests, and never to forget, that if we expect good crops, we must

feed the soil with as much regularity and care as we do our animals.

Statistics.—The experience of the past year most clearly demonstrates the importance of the effort which has been made to secure the statistics of our crops. No farmer could have read the reports made in our last volume of Transactions without being impressed with the importance of this work. Defective as such reports must of necessity be, still there are a mass of facts there given which must lead to reflection and to action. The reports of the present are still more valuable than those of last year, and we indulge the hope, that the Legislature will soon see the importance of securing an annual return of the statistics of our crops and domestic animals, which would prove of the greatest importance to our farmers, and to the commercial interests of our State.

We have read with much interest the reports made in Ohio, and we presume that our readers will be astonished, as we were ourselves, at the number of sheep destroyed by dogs in the year 1858, amounting to 60,536 sheep killed, and 36,441 injured. Total damages to flocks in one year, \$146,648. Suppose our State suffers in a like ratio, who believes, that our farmers would submit to this depreciation of their flocks to one-fourth of their whole value for another year, if a remedy could be provided. This is but a single item, showing the importance of having this subject brought annually before the people, and we hope the Society will not suffer this matter to rest until efficient means are put in requisition to correct the evil.

The Dairy.—The Executive Committee feeling the great importance of the dairy interest in our State, and the necessity of a more practical knowledge of the various grasses adapted to pasturage and hay, made a liberal offer for an essay which should fully describe the various kinds of grass adapted for pasture and hay, and the best means of culture for each purpose, believing that in no other way could they further advance the interest of this most important branch of agriculture. One essay has been submitted to the Executive Committee, which possesses many very valuable suggestions, and has an account of some very well conducted experiments, but still does not come up to the requirements of the proposal made by the board, and would not, in the judgment of the committee who examined it, or in that of the Executive Committee, prove such an addition to the present knowledge on the subject as would justify an award.

It is presumed that this offer will be continued, and we hope the right man will be found, who will carefully investigate the subject and prepare such a work, with such experiments, as will fully meet the requirements of the board.

Manure for Meadow Lands.—In our last report we gave a most valuable report of an experiment with different manures on permanent meadow lands, part first, by Professors Lawes and Gilbert, Rothampstead, England. We are gratified in being informed from various quarters that this valuable article has not only been carefully read, but is very highly appreciated as one of the best articles yet published here on the subject. We give in this report the second and third part, in continuation of those important investigations, and we feel assured our farmers will agree with us in the opinion that these investigations are invaluable, and are the very facts we must become familiar with, in order to preserve and to improve our meadow lands.

Steam Plow and application of steam power to the cultivation of the soil.—In the last report presented to the society, a reference was made to the steam engine of Charles T. Mann, of Troy, which had been entered for trial, and a committee appointed to examine its operation. The engine and apparatus for plowing not being in order, the result was not satisfactory, though indicating a hopeful working of the engine when the defects should be remedied. Application was made to the Executive Committee to aid in testing this engine on the fair grounds, during the late fair, assurance being given that the engine was now in complete order, and about to be sent to Illinois to contend for the prize offered there. The Executive Committee believing the assurances given, and being desirous that a machine invented by a New York mechanic should be tested here if it promised success, acceded to the application, and Mr. Mann was present during the fair, and a committee appointed to attend to its trial. It is much to be regretted that the machine did not fulfill the expectations of those who were most sanguine of its success, and the result of the various trials made on the ground, though satisfactory as to the moving power of the engine, did not add anything to the trial of last year as a plowing machine, and it is evident, that until Mr. Mann shall secure some competent and practical mechanic to prepare an apparatus for the working of plows, he cannot hope for its successful introduction into the field.*

* We regret to announce the death of Mr. Mann since this report was prepared. He was on a tour to the South when he was prostrated by his disease, and died in February.

The Executive Committee, so far as they are advised or have information, are of the opinion that Mr. Mann's machine has an arrangement for its propulsion, equal if not superior to any which have been brought before the public; and it is much to be regretted that it was again brought into the field without suitable preparation for its successful trial, as it is believed might have been secured by a proper attachment for plowing.

While it is probable that the extensive prairies of the west will be most benefited by the introduction of steam in the cultivation of the soil, it will prove of much advantage, also, on many of our farms in this section. It may be used for all the purposes for which any engine may be used, in addition to the work which may be accomplished in the field; and it is, therefore, hoped that another year will give us a machine which can be successfully, and at the same time, economically worked.

Agricultural Implements from India, and Agricultural Museum.— Since the last report many very valuable additions have been made to our Agricultural Museum, and the increased interest which is manifested in this department, shows its importance. Agricultural implements, and various others, from India, have been presented to the Society, by L. H. Morgan, Esq., of Rochester; and serving, as they do, to illustrate the implements of agriculture reaching back to the remotest periods, they are deserving of notice. Various other additions have been made during the past year, which are interesting and useful. A catalogue of the contents of the museum is being printed, and will soon be issued, which will enable visitors much more readily to examine the museum. This museum has been secured with very little expense to the State, or the Society, and, while it is desirable that some additional effort should be made to increase it, as opportunity offers, it is not proposed to make application to the Legislature, at present, for that purpose. The Executive Committee, however, are of the opinion, that among the many appropriations annually made by the Legislature, very few of them are so well entitled to favorable consideration as one in this direction would be.

To the mechanics, implement makers, farmers and others who have contributed to this valuable collection, the Society is greatly indebted, and it is hoped that still more interest will be taken in this subject hereafter. A very large addition to the seed department has been secured during the past season, in response to a circular issued from the rooms of the Society, and those who have not yet forwarded their collections, doubtless will, in due time,

furnish specimens. It is from these contributions that we are enabled to secure an extensive interchange of valuable seeds from foreign countries, many of which have already been successfully introduced into our State, and are valuable and useful to our farmers.

Liberia Agriculture.—A very interesting communication was received during the past summer, from the Colony of Liberia, in Africa, on the receipt of the Transactions of our Society, which were furnished to Rev. B. R. James, the agent of the colony, when in this country a year since. We have also received an account of the annual fair of the Agricultural Society, which will be found among the papers submitted, and shows a very creditable advance in agriculture which, doubtless, will be surprising to most of our readers.

Transactions for Russia.—An application was made, during the year, from the Russian government, for a set of our Transactions for the Imperial Library, and we were, fortunately, enabled to furnish a complete set of the work. We have already received valuable works in return, and others are promised. Our publications are already furnished to most of the governments of Europe, and constant demands are being made for them. We deem it of great importance to furnish these works wherever they are desired, and we have the most gratifying assurance that they are not only the means of making our country more generally known and appreciated, but are the means of introducing abroad our most valuable farm implements to such an extent as to make this trade a very important item to our manufacturers.

American Agricultural Implements in England.—As an evidence of the great change of opinion in Great Britain and in Europe, as to the value of our implements, we notice in the last number of the Royal Agricultural Society's Journal, of England, a letter from C. W. Eddy, of Oxford, England, who spent some time in this country, and examined, with much attention, our various implements, both in the field and in the workshops, and expresses himself decidedly favorable to the introduction of them into that country. A minute description, with illustrations, is given of the most important implements of husbandry, their cost, and adaptation to the work for which they are designed. He alludes to the reapers and mowers, now a success in England. The owners of the McCormic reaper, in a late paper, state that they have put in operation more than two thousand of these machines since 1851, and the demand is larger at the present than at any previous period.

Mr. Eddy alludes to the American plow at the great exhibition in 1851, and our readers will not fail to remember how it was made the subject of remark there; how, before that exhibition closed, it was brought to trial, and was acknowledged, after all, to be a very clever plow.

All these indications show that the great exhibition of the industry of all nations was one of the means by which American implements were introduced to the knowledge of the world, and now they are to be found in every agricultural portion of the globe, or nearly so, contending successfully, and in some cases, entirely superseding the English implements. This Society took an active part in that great exhibition, and the results to our State and country have been of so valuable a character that it is believed none of its friends will regret the expenditure, made to accomplish so important a work.

World's Fair, 1862.—In 1862 another exhibition, of a similar character, is proposed to be held in London. We trust this Society will not fail to be represented, through its members, in all the departments, at that exhibition. America will be expected to make herself still more widely known. At the first exhibition, but little was expected; but, unsatisfactory as our exhibition was, even to ourselves, we achieved a great triumph, in giving the first living, working reaper to the world there represented. We achieved a good name, and we have followed it up by sending our implements in every direction. It will be expected that we shall sustain the reputation we have acquired in these past ten years. And let not the Empire State falter in this work; more can be accomplished in this way than in any other; and we would urge upon our manufacturers, implement makers, and mechanics generally, to be in season with their preparations, and be prepared with intelligent and practical men to superintend the trial of their machinery and implements. In such a trial we do not fear the result; at least we shall then have the satisfaction of having done what we could for the world's advantage, and should others excel us, we will not fail to avail ourselves of the improvements they have made.

Baron Humboldt.—In the distribution of the Society's Transactions for 1857, a number were sent to the Hon. Joseph A. Wright, of Indiana, American Minister at Berlin. Among others to whom the volumes were presented, was the late Baron Alexander Von Humboldt, a name than which none more distinguished is to be found on the record of our own or any other age, for all that can

contribute to the advancement of science and intelligence to mankind. Humboldt had traveled in America, North and South, and had made himself familiar with our institutions, and, during his long life, had ever treated with the greatest kindness and courtesy every American gentleman who called upon him at his home. The volume was presented to him by Mr. Wright, and his letter acknowledging its reception, probably one of the last ever written by him, expressed his attachment to our country, and his intention, as soon as he should have leisure, to acknowledge to the Society, in a more formal manner, its reception. He was not permitted to do this, as his life was brought to a close on earth a few days after he received it. Mr. Wright, deeming that this letter would be one of interest to our Society, forwarded it for preservation here, where it will remain as a memorial of this truly great man, and as evidence of his regard for our institutions and our country. (The letter of Governor Wright, and that of Baron Humboldt, will be found in our Transactions for 1858, p. 583.)

Entomological Survey.—We are furnished with another report from our esteemed Entomologist, Dr. Fitch. The value of his investigations as they progress, are attracting increased attention, and their great importance is more and more appreciated. It is a source of gratification that we have, by the liberality of the Legislature, been enabled to carry on these investigations of such unspeakable importance to the agricultural interests of our country and the world. In Dr. Fitch's report for 1857, was given Say's article of "Hemiptera," which had never been previously republished. A complete edition of Say's entomological works has lately been published, edited by Professor Le Conte, in which is given this work, acknowledging the same as first published in our Transactions.

This 6th report of Dr. Fitch treats of insects injurious to trees, &c., and will be found of equal interest to any which have preceded it.

The arrangement of the insects described in Dr. Fitch's various reports, it is expected will be completed during the ensuing year (1860), and an opportunity will then be given to all who are desirous of becoming familiar with the subject, to pursue their investigations with specimens, not only of the insects, but also of the woods and leaves on which their depredations have been committed.

Visiting Farms.—The Executive Committee feeling the importance of continuing their plan of visiting and personally examining the farms entered for premiums, have during the year had all the farms entered for premiums examined by committees appointed for that

purpose. Their reports will be found in connection with the farm reports. It is to be regretted that more farms are not entered for examination. The experience of the Society furnishes evidence of the great value of these reports, made by the farmers themselves as well as by the committees of the Society. Many of these are published in many of the agricultural publications in our country and abroad, and our farmers examine them with much care and attention. In one particular instance we have been informed that a farm to which the first premium had been awarded, was visited, in one season, by upwards of fifty persons out of our own State, while of those residing in our State, the number was probably much larger. We mention this to show the importance of this kind of investigation, and we are confident that our best farmers can in no way do more real good to the progressive farmer, or benefit himself more than by presenting his farm in competition for the prizes of the Society. The reluctance of farmers to engage in this work we know is very great; the requirements are considered by many as too rigid; and they hesitate in making the effort. But when once made, we believe not a farmer who has made the trial but what is satisfied, that so far as he is himself concerned, a great work has been done. He becomes aware of his own deficiencies, he is directed to the means by which they may be remedied, and he himself becomes a better farmer, and at the same time has become the means of encouraging others, it may be, to make improvements, which without this might not have been made.

Manures.—The subject of manures is justly attracting much attention, and, as a natural result, the introduction of special manures in some parts of our State, is already become a very important business. Connected with this, it is not to be disguised that gross impositions are palmed off upon the farmers. The increase in the consumption of guano and other artificial manures is very great, and as a consequence, the adulterations are increasing, and it is due to the farmers that every possible precaution should be had to prevent imposition. Whatever economically tends to increase our crops, and at the same time keep our land in good condition, is deserving of encouragement. The examples which are so frequent in Great Britain, of vending spurious manures, to the great detriment of the farmer, should lead us early to take measures to prevent the same scenes amongst us. It is very creditable to a sister Society, (Conn.,) that the very capable gentleman who has been in the employ of the Society, Prof. Johnson, has done good service, and has been the means of preventing the dis-

tribution of various preparations, whose value bears but a very limited proportion to the prices paid for them; and we cannot be too vigilant in reference to this subject. It is to be hoped that this society will soon be in a condition to take an active part in a similar work here, and thus aid the farmer in obtaining what shall be useful to him, and at fair prices.

Annual Fair at Albany, 1859.—The nineteenth annual fair was one of the most encouraging, as well as one of the most successful, which has ever been held by the Society. The Society is indebted to the farmers and mechanics for this success. This was the third fair held near the city of Albany, and to many who remembered the previous fairs—the improvement and advance which had been made in every department, was most apparent, and we were often reminded during the fair, with the marked superiority of this fair. The Society had a right to expect this, and its expectations were more than realized. The arrangements for this fair were more complete and convenient than on any former occasion, and the location of the grounds was such that the Executive Committee were enabled to carry out what they had long desired. The plan upon which the erections were made, prepared by a committee selected for the purpose, and adopted by the Board, gave to the exhibitors in every department a fair opportunity of conveniently exhibiting their articles, and of securing an examination by those in attendance. Instead of being scattered over the entire area, the buildings were arranged on the sides of an open area of 150 feet in width, passing through the entire ground; and the public were at liberty to examine the articles without traversing the whole enclosure. The cattle, arranged *by themselves in their order*, in comfortable stalls; the horses in a convenient portion of the grounds, separate from the rest of the exhibition, in stalls, enabled the officers to carry out what had long been desired—a control over the exhibition in this department. Sheep, swine and poultry were also conveniently located, and taken as a whole, we have never seen a show ground so conveniently arranged for exhibitors and visitors. The sketch which we have given of it will convey to the reader the advantages it possessed. The erections were well adapted to the purposes of the Society, and did great credit to the local committee and the builder. Many were fearful that the erections would not be filled, but the day previous to the opening, required an additional building, and a large number of stalls for cattle and horses. The first day of the fair gave unmistakable evidence that this was

to be *the great* fair of the Society; and in the number of entries, in the quality of the stock, implements, machinery, domestic goods, new inventions, fruits and flowers, it may with safety be said that it has not had its equal in this State, if it has in the Union.

The attendance of the people was very large; and, while the pleasant and agreeable weather during the entire fair week was all that could have been desired, and added largely to the number of visitors, still the facility with which the public could reach the city, the abundance of accommodations for all, evinced the peculiar adaptation of the locality for an extended and successful exhibition.

It should be borne in mind that the exhibitions of this Society have been strictly confined to the legitimate objects of its charter, "*To improve the condition of Agriculture, Horticulture, and the Household Arts.*"

This year, as the last, the Society had the pleasure of exhibiting to the public the gratifying advance which had been made by the Society. The number of exhibitors exceeds any previous year. The exhibitors in the leading departments are not confined to a few individuals, but are widely dispersed throughout the State—the Society thus accomplishing what has steadily been its object, the diffusion of its improvements throughout the State. All the officers of the Society, with one exception, were present during the fair, and were fully employed, from its commencement to its close, in the discharge of their duties, and evidenced the great interest which is being taken in the discharge of the duties devolved upon them by the Society.

This exhibition has left such an impression upon the minds of the people in its complete success, as can never be effaced. All the incidents attending it, were of the most gratifying nature, and in the beauty of the weather, and the enthusiasm of the exhibitors and of the visitors, the fair of 1859 was such an one as the continent might have presented to the world, to demonstrate what had been accomplished for agricultural science. The Society had a special cause of gratulation that a success so marked, should have attended the holding of the State fair at the city which is the capital of the State. From the enlightened liberality of that State, the Society has received such a support as gave its foundation firmness, at a time when they who declared that agricultural science must advance, were experimentalists. It had not been importunate in its demands. It had preferred to receive gratefully whatever the good judgment of the State willed in its be-

half. Now, it was able to present these extraordinary *results* to the State and its representatives at the seat of government.

The experience acquired by the Society in the many years of its existence enabled it to devise a thorough system of order for the management of the fair. All the annoyances that may have been the result, in former years, of the novelty of any public gathering of this nature, are now unknown. In all parts of the fair, the proper responsibility is found for the proper duty, and an example of system, of purpose, of efficiency of means working to a desirable end is given, and is, in itself, not the least valuable of the benefits wrought out by the Society.

The Governor of the State, many of the State officers, Senators and members of the House of Assembly, gave the fair the honor of their attendance. The exhibition must have been most gratifying to these gentlemen, to whom the State has given such important trusts in its government. They could see that the people were prosperous, in a prosperity based upon the advance of the science of the culture of the earth. The Canadas, New Brunswick, the sister States, sent their representatives to witness what New York was doing to make the farmer a happier, a wiser and a wealthier man. These gentlemen left our grounds to take home new lessons. These were to them no idle days, no time passed in the midst of an ornamental delusion. They felt themselves surrounded by facts, as impressive as valuable. So shall other communities, far out of the territorial range of Society benefit by its labor and be better for its existence.

The crowd at the fair was vast. It was in the strength of a great popular demonstration, during all the days in which the grounds were open to visitors. Through all the halls, in the area devoted to the exhibition of the stock, wherever any result of care, of skill, of labor, was to be seen, thither the crowd went, and that crowd was eminently an appreciative and an intelligent assemblage.

The fair of 1859 was eminently one of results. This can be best appreciated by those familiar with the past exhibitions of the Society. During the long interval that had occurred since the fair was first held at the capital of the State, machinery had become the protean servant of the farmer, meeting him with untiring obedience at every step of his sowing and reaping, and he could see before him the pioneer of the greater effort to be his very plowman. Ever in his home, and to assist those whose

toils had been so wearisome, the wheel and the iron were at his own and his companions' command.

The stock had risen to an average of great excellence. There were more farmers everywhere who knew the reason of the culture they practiced, and were scientific men in the practical and potential sense.

That which the Society had predicted would follow the labor and judgment of industrious and enlightened men, had become a produced fact, and in the area of the fair the Society pointed to its triumphs.

The State Agricultural Society recognizes no other end to its labors than the multiplication of these results. It cannot cease till education and prosperity and the home life of the farmer are made inseparable. Friends have now accumulated around it, many of whom have passed a large portion of their life in sustaining and advancing it. It is the glory of these friends that all they have done has been to advance the good of their race.

Agriculture must be the first business of a free people, and this must be scientific as well as practical agriculture. He who works, must think as he works, and see all around him the reason of his labor, and before him its results, the wise adaptation of the best results of mind to the best culture of the earth.

The Society welcomed the Honorable John A. Dix to the duty of the pronouncement of the annual address. Read by thousands, it has already found its place in honor by the side of those delivered by the distinguished list of statesmen and scholars that have preceded him.

Embodying this narration of the fair in their Transactions, the Society find, in the record, the keenest incentive to grateful and determined perseverance in the good work of agricultural knowledge.

The complete success of this fair cannot fail to lead to increased efforts on the part of the Society, not only to sustain the ground already occupied, but to extend its influence into every section of the State, until not a portion shall be left without evidence that the work of advance and reform has been secured.

It is surely a matter of congratulation, that the Society has been enabled, by its steady, persevering efforts, to accomplish such results as have been witnessed the past year. The influence which is being exerted is not confined to our own State and country, but is felt everywhere, as the intelligence is conveyed through our

Transactions to other countries. Let us, then, redouble our efforts; let us, in all our movements, give to the world the results of experiments carefully made, and which, proving successful here, will lead others in like manner, to more systematic efforts to advance the good cause.

The Society has been called to mourn the death of three of its former officers, and intelligent and useful members of the Society for many years. Hon. Anthony Van Bergen, of Coxsackie, aged 73 years, Hon. Joel Turrill, of Oswego, aged upwards of 60 years, B. B. Kirtland, Esq., of Rensselaer, aged 54 years, all deceased in the month of December. They were most active, influential members of the Society. Attached to the profession of the farmer, they had severally been instrumental in advancing this great interest; had secured the confidence of the public by their wise and prudent course in reference to the cause of agriculture in our own State, and had been the means of accomplishing much for this good cause. They are taken from us, to be no more with us here; but the memory of their lives will live, and 'be a rich legacy to those they have left behind them. We would urge upon all the members of this Society to imitate their example, and thus secure to themselves the plaudits of good and faithful servants. The Executive Committee appointed a committee to draft a report in relation to these departed brethren, which will, in due time, be presented to the Society, and will be placed upon its records.

From the report of the Treasurer it will be seen that the entire receipts of the past year have been \$24,410.26, and the expenditures \$18,724.19, leaving a balance of \$5,686.07.

B. P. JOHNSON,

Corresponding Secretary.

REPORT ON DEATH OF MEMBERS.

Hon. William Kelly, from the Committee, presented the report on the death of Hon. A. Van Bergen, Hon. Joel Turrill and B. B. Kirtland, Esq., as follows :

In the annals of the New York State Agricultural Society, no such melancholy record exists in relation to the loss of valuable members, as that which marks the month of December 1859. Within that brief period passed away three of its most distinguished supporters, all of whom had held important offices in its management, and had exhibited an earnest and intelligent interest in the advancement of agriculture.

Benjamin B. Kirtland, of Greenbush, Rensselaer county, died on the 6th of December, 1859, aged 54 years. He had long conducted extensive farming operations, with a vigor and skill which commanded success, and gave demonstrations of the advantages of improved husbandry. At an early period he recognized Agricultural Societies as the best agencies for extending information on this subject, and inspiring a proper spirit of emulation. He was long a member of this Society, and for a period of five years, from 1853 to 1857 inclusive, he held the office of treasurer, performing the duties of the office with a zeal, fidelity, and intelligence not excelled. Compelled by ill health to retire from the cares of the office, his withdrawal was a cause of much regret to those who had been associated with him and knew his worth.

In his private relations, General Kirtland was equally worthy of admiration. With a heart of true charity, and a hand ever ready to be extended in acts of benevolence, he won the love of all who knew him, by his beautiful exemplification of the christian character.

Joel Turrill, of Oswego county, died December 26, 1859, aged about 60 years.

His was a varied career. He was not without distinction in his profession of the law, and was elevated to the bench as judge of the county. He had also the honor of representing his district, first in the Legislature of the State, and afterwards for a number of years in Congress ; performing the duties of these several positions in a manner creditable to himself and acceptable to his constituents. Subsequently Judge Turrill, was appointed by President Polk, the Representative of the United States at the Sandwich Islands. Here he remained for a long period, ever prompt to protect American interests, and to encourage the sovereign of those islands in maintaining their true independence then threatened by the unjust demands of a European nation.

On returning from his distant mission he abandoned public life, and gladly devoted himself to the quiet pursuit of agriculture. His interest in the promotion of improved husbandry was manifested in his own farm management, and in his efforts to increase and extend agricultural knowledge.

He was at the time of the death, and for some years previous had been president of the Oswego County Agricultural Society. In the State Society he held, during the year 1858, the office of vice-president, and those of us who were then associated with him, can bear testimony to the maturity of his judgment, as well as to the efficiency and courtesy with which he performed the duties imposed upon him.

Simple and sincere in his manners, animated by a spirit of kindness, and actuated by a desire to be useful, he was universally esteemed, and has gone down to an honored grave.

Anthony Van Bergen, of Coxsackie, Green county, died December 28, 1859, aged 73 years.

Judge Van Bergen was, for a large portion of his life, engaged extensively in farming. He had manifested at an early period a desire to advance practical agriculture, and at one time he received and instructed young men in the principle and practice of farming.

He was elevated by the people to posts of honor and trust, in all of which he exhibited ample ability and inflexible integrity. But his heart was not in public life; his chief pleasure was the pursuit of agriculture; his most cherished title that of farmer, and this love continued throughout his life.

No man was more regular than he in attendance upon business meetings and the exhibitions of our Society. One year ago he was present at our annual meeting, and many will recall with emotion the cordial pressure of the hand with which he greeted them as brother farmers on that occasion.

Judge Van Bergen was one of the early presidents of the New York State Agricultural Society, having held that office during the year 1839. He again became a member of the Executive Board as vice-president in the year 1851.

In his private character he was distinguished by great cordiality of manner and a true christian deportment. Ripe in years, prepared for the summons of the Master, he died as the good man dieth.

In view of these sad bereavments, and impressed with the conviction that it is our duty to record in some enduring form our appreciation of these useful and good men, your Committee would recommend for adoption the following resolutions:

Resolved, That in the death of Benjamin B. Kirtland, Joel Turrill and Anthony Van Bergen, the New York State Agricultural Society has sustained the loss of three of its oldest associates and warmest friends—the cause of agriculture, three of its most devoted and intelligent disciples—and the christian community, some of its most exemplary and respected members.

While as individuals we mourn the departure of those who have been endeared to us by long companionship, and whose intercourse with us has been marked throughout by kind feeling, by christian courtesy, and by cordial sympathy in all the objects which, as farmers, we have had at heart; as a board, we deplore the loss of those whose valued labor has been associated with every important enterprise of this Society, and whose example as liberal minded, intelligent farmers, was so well calculated to inspire all engaged in that pursuit with higher aspiration and with greater love for their calling.

Resolved, That this report and the accompanying resolutions be entered at length on the minutes of this board, and be printed in the Transactions of the Society.

Resolved, That a copy of this report and resolutions be sent by the Secretary, under the seal of the Society, to the family of each of the deceased, with the assurance of the sincere sympathy which the members of this board severally feel for them in their affliction.

WILLIAM KELLY,
THEODORE C. PETERS,
BENJ. P. JOHNSON,
C. S. WAINWRIGHT,
S. CHEEVER.

ADDRESS.

BY HON. JOHN A. DIX, OF NEW YORK.

Mr. President, Ladies, Gentlemen of the Society, Fellow-citizens :

Twelve years ago I had the honor to appear before this Society at one of its annual exhibitions in a neighboring county, under circumstances of a peculiar character. I did not come then, as I do now, to present any views or state any conclusions of my own in regard to the great interest, to which your labors are devoted ; but to perform the vicarious service of reading to you the address prepared for the occasion by SILAS WRIGHT. Most of you, I do not doubt, remember well that the address was written by its distinguished author during the intervals of agricultural labor through the summer harvest—not the mere labor of superintendence, but earnest and thorough field-work, with the scythe, the rake and the hay-fork, standing side by side with his laborers, and measuring his own strength with theirs. A few hours after the closing lines of the address were written, he died suddenly of an affection of the heart. They were, probably, the last lines traced by his pen ; and there is no doubt that the sudden termination of his life is to be ascribed to the equally sudden change of his habits—from the sedentary occupations of twenty years in court-rooms, executive bureaus and legislative halls, to the hard labor of a farm. It might, at first glance, seem more in harmony with the tenor of his public career, if he had fallen in the Senate chamber—the theater on which his distinction was chiefly earned. But those who know how little he prized public office and its honors, how much more he loved the quietude of the country and the occupations of rural life, cannot but regard the closing scenes of his earthly pilgrimage as peculiarly in accordance with the tone of his thoughts, the simplicity of his character, and his devotion, throughout his whole official career, to the cause of productive industry.

It is no small distinction to the agriculture of the country and the State to have numbered among its followers a man of so much talent and purity. If it had been the order of Providence that he should have lived to attain the highest political honors of the republic, his incorruptible integrity, his conscientiousness, his firmness, and his thorough acquaintance with the details of public business must have told with great effect upon the administration of our national affairs, by checking extravagant expenditure, correcting abuses, and giving steadiness to the movement of the government in critical emergencies ; and at the close of his labors he would have

returned with the same simplicity and unaffected zeal to the cultivation of his farm.

I have not alluded to this subject for the mere purpose of paying a tribute of respect to the memory of a departed statesman, peculiarly connected as he was with the cause of agriculture, and with the proceedings of this Society; but as an appropriate introduction also to the principal subject of his address—the importance of the foreign grain and provision market to the farmers of the United States.

Twelve years ago this subject was scarcely deemed worthy of a place in our schemes of domestic economy; and it is one of the strong evidences of Gov. Wright's sagacity and forecast that he should have made it the leading topic of discussion in his address. Indeed it had acquired, at the time he was discussing it, an importance of which he himself was not aware. Our exports of breadstuffs and provisions in 1846 were a little less than \$28,000,000. In 1847, they rose to nearly \$79,000,000; but at the time he was preparing his address, the statistics of the year had not been collected and published.

During the last fifteen years these exports of our agriculture have made a great though not a steady advance, and it may be safely assumed by agriculturists that there will be a constant demand in the European markets for the products of their industry—a demand as uniform as the varying productiveness of different years abroad will admit. I think it may be stated as a proposition from which the farmers of the country may draw conclusions, and by which they may be guided in their practical operations, that Europe cannot raise a sufficient amount of food for the consumption of its increasing population, and that even with the most abundant harvests there will be an annual deficiency, which can only be supplied by the United States.

This whole subject has been treated with great ability by Mr. John Jay, of the city of New York, in an address on the Statistics of American Agriculture before the American Geographical and Statistical Society; and I shall draw largely from the materials collected by him in support of the proposition I have stated.

It is well known that in most of the principal states of Europe, and nearly all the minor, the increase of population, though small in proportion to the rate of increase in the United States, is greater than that of the means of subsistence. In old and thickly settled countries, it must, of necessity, be so. The best lands having been long under cultivation, poorer soils must be resorted to as population increases, and with it the demand for food; and the difficult question always arises, (a question only to be settled by experiment,) whether the products of these soils will be equal to the increased demand for them; or, in other words, whether the whole labor of the additional population can extract from them a supply of food sufficient for its subsistence? This question may be considered settled, not only in Great Britain, but in most of the countries of central and southern Europe. The conclusion has been manifesting itself for years in

practical, and not always the wisest measures, to remedy an inconvenience felt, rather than accounted for by any rational investigation of its causes,—sometimes by the prohibition of the exportation of breadstuffs, and at others by the imposition of duties on foreign grains to protect and stimulate domestic production. In the meantime the deficiency has been continually increasing, and large masses of people have been supported by constantly diminishing amounts of food. France, as a nation, has not enough to eat. It is estimated that four millions of her inhabitants do not eat bread. The vine, an exhausting crop, which gives back to the earth none of the nutriment extracted from it, takes an immense extent of surface from the production of grain, and in central and southern Europe, as well as in France, is annually increasing the necessity for supplies of foreign breadstuffs. In the last named country, too, the cultivation of the beet root for the sugar manufacture has reduced the surface for the production of grain; and, on a recent occasion, the Emperor found it necessary to allow its free importation from other countries. In England, the deficiency of breadstuffs has become still more apparent; and though she exported largely a century ago, she is now a large importer, and her inhabitants cannot be subsisted on what she produces. She may be considered, from the density of her population, as having nearly, if not quite reached her maximum capacity for production; and the one thousand people added every day in the year to the number of her inhabitants, must be subsisted by imported food.

This increasing demand for food in Europe has been largely supplied by us. During the last eleven years our exports of breadstuffs and provisions have averaged over \$47,000,000 per annum; and of the exports of 1847, over \$55,000,000 went to Europe. Their increase will be better understood by comparing the last seven years with the preceding seven. During the former period they averaged a little over \$31,000,000, and during the latter, nearly \$50,000,000. The average of 1856 and 1857, was over \$75,000,000. In 1858, we had, in some of the large wheat-producing States, a short crop, and the exports of the year may show a diminution. Fluctuations in the amount of agricultural exports are unavoidable. A deficient crop in any country necessarily limits its ability to export—as it can only part with the surplus which remains after supplying its own people. This inability in the countries of Europe to supply their own inhabitants with food, the certainty that it must become greater as population increases, and the assurance that it can only be met by the products of our own agricultural industry, make the subject one of the most interesting and important that can engage the attention of the American farmer and statesman. It concerns the prosperity and the progress of the country for centuries to come, and its exemption from any serious or lasting disturbance of our friendly relations with European powers. No country can afford to quarrel with another, from which it derives the means of subsistence. Nor can the country which furnishes the supply afford to part with its valuable customer. There is every reason, therefore, to expect that

questions of dispute will be discussed and adjusted in a spirit of mutual forbearance; and where such a spirit exists, there can be no long continued alienation.

To you, gentlemen, as a part of the agricultural interest of the country, the question presents itself under a variety of the most important aspects. Can the production of food in this country be made to keep pace with the European demand for it? In other words, can the additions to be annually made to the population of Europe, be sustained by the export of our agricultural products? This is a great question of political economy, which may be elucidated by theory, but the answer to which the farming interest of the country must work out in practice.

There is certainly no country better adapted than ours to become the granary of the world. It occupies the most favorable portion of the North American continent for production, neither running up to the regions of severe cold on the one hand, nor to those of excessive heat on the other. It is the great temperate district of the western hemisphere, and yet so extensive as to embrace every variety of vegetation, which does not require the stimulus of intertropical heat. Navigable rivers, almost unequalled in the surfaces which they water, are so many great natural channels for conveying our products to the Atlantic Ocean, which has, within our limits, a coast of nearly seven thousand miles in extent, affording extraordinary facilities for commerce. A few hundred miles back from the coast a range of mountains, with a mean altitude of 2,500 feet, runs from north to south, and in the more heated districts furnishes on its slopes the mitigated temperature which arises from elevation. Our territorial area, including California and Oregon, is nearly 3,000,000 of square miles—a larger surface than that of Russia, in Europe. British America has a little over 3,000,000, but a large portion is locked up in hyperborean frost. Taking the Atlantic district, from the Gulf of Mexico to the lakes, with the vast territory drained by the Mississippi and its tributaries, embracing altogether a surface of nearly 2,200,000 square miles, and I believe it may be safely said that there is no region on earth of the same magnitude, which has an equal capacity for production. With the exception of New England and the Middle States, there are in every portion of this extended district large quantities of the most fertile land, which the hand of agriculture has not yet touched; and I believe it may also be said that there is no portion of any considerable extent, which is absolutely unproductive. Of the Pacific district we know little, except from the constant tide of treasure, which for ten years has been setting into our Atlantic cities. Enough, however, has been gleaned from the hasty and imperfect explorations which have been made, to assure us that over this great district the richest fields of grain are hereafter to wave, and that numberless herds of cattle are to range through meadows and over mountain slopes clad with grasses unsurpassed in luxuriance. There is a great district, spreading out from the eastern slope of the Rocky Mountains, which nature, it is said, has consigned to perpetual barrenness. Scientific observations seem to warrant this conclu-

sion. But let us not decide too hastily. I remember when it was asserted, on the basis of actual exploration, that there was only fertile territory enough between the Mississippi and the Rocky Mountains for four States of the size of New York; and yet a surface vastly more extended is now occupied under State or Territorial governments, and promises to rival in productiveness the richest soils in the Union. We all remember that it was demonstrated on principles of natural science that the Atlantic Ocean could not be navigated by steam. And yet, in a few years afterwards, steamers were regularly crossing it, with voyages averaging from ten to fifteen days, and they are now so multiplied, that they threaten to supersede sailing vessels in carrying on the commerce of America with Europe. Science never fails to give the true solution of a problem, if it is in possession of all the elements which belong to it. It may be that there are elements of production in the region referred to, which have escaped observation, and that it may, at least, be found, as I believe it will, to be much less extended than is supposed.

I have thus briefly alluded, gentlemen, to the physical characteristics of the immense region over which dominion has been, in the order of Providence, given to you and your fellow countrymen. It is the noblest inheritance ever bestowed by the sovereign ruler of the universe on any race of men that has inhabited the earth. We possess it, too, under advantages which no other people ever enjoyed. Our independence as a nation was almost coeval with the new impulse given to the natural sciences by the genius of the old world. They have, in our own day, reached a point from which there seems to be little left to be accomplished in the future, except through the application of established principles. We know the elementary substances which enter into the composition of organized and unorganized bodies. There is nothing we deal with, of which we do not know the nature and the characteristic properties. We understand, in all its intricacies, the marvelous mechanism of the human constitution—all but the etherial spirit which animates it, and the knowledge of which alone, as an emanation of the Divine essence, the great Creator reserves to himself till the fullness of our time shall come. During the last few years, natural science, which had expended its labors on astronomy, chemistry, geology and the mechanic arts, has been turned to the great field of agriculture. It has analyzed soils, and disclosed their constituents; it has taught us the composition of plants, the nature of the food they require, and the degree in which they extract from the earth its principles of fertility and impair its capacity for their reproduction.

It is thus armed that we are entering on the great work of subduing the untamed soils of the western hemisphere, and making them yield what is needed for our own sustenance and for the unfed multitudes of the old world. I say we are just entering on this work, for only about one-thirteenth part of our vastly extended territory is under cultivation. Small as this portion is, I fear but little of it is improved as it should be. Our whole system of agriculture has been one of gradual spoliation. The soil, which we should

have at least preserved unimpaired in fertility, has been rapidly deteriorating in our hands. The southern planter has been in the habit of extracting crop after crop of tobacco and corn from his lands, and when they had lost all capacity for production, of abandoning them and emigrating, with his negroes, to new soils. The northern farmer has done the same thing, not without some feeble attempts, perhaps, in most cases, to keep up, by rotation of crops, the average fertility of his land; and multitudes, who have emigrated from the east, are carrying on the same process of exhaustion on the prairies of Illinois, Wisconsin and Iowa. I was last spring in a city in one of these States, on the Mississippi, and found the inhabitants throwing their manure into the river. I inquired the cause of this extraordinary practice, and was told in reply, that their lands were naturally fertile enough without artificial aid. A few years will bring with them, as time has everywhere else, the penalties of wastefulness, in diminished crops and lighter grains. The annual loss in the United States, from the abuse of the soil, is to be computed not by millions of dollars, but by hundreds of millions. We know, from statistical facts, that the average production per acre has greatly diminished. In this State, less than a century ago, the average wheat crop was over twenty-five bushels per acre. It is now about twelve. In Ohio, one of the most fertile States in the Union, and but little more than half a century old, the average is about the same as in New York. The virgin soil is already half worn out. In some of the southern States, the deterioration has been more rapid, and the average production is still less. These are the legitimate fruits of careless systems of husbandry. They are not merely careless—they are systems of the most wasteful and culpable extravagance. The man who extracts from his land all it is capable of producing, without giving back to it an equivalent in fertilizing substances, is in fact selling his farm in his crops. It is precisely the system of the prodigal, who spends his money capital, instead of living by a prudent economy on the interest. It was the same system of spoliation which exhausted the grain fields of imperial Rome. Cato, more than two thousand years ago, and Columella, Varro, and Virgil, at a later day, wrote learnedly, and some of them gracefully, on the subject of agriculture. They laid down the most unexceptionable rules in regard to rotation of crops, the cultivation of plants, the treatment of the soil, and all the leading subjects of practical husbandry. But the agriculture of Rome died out under their precepts, and the desolation of the campagna, once the prolific mother of nations, and now, to a great extent, overrun with noxious vegetation, and made uninhabitable by pestilential exhalations, attests the insufficiency of their systems. The Maremma, in ancient Etruria, was exhausted by the same process of spoliation; it became nearly uninhabitable, and, like the campagna, exhaled an atmosphere of pestilence and death. But by the persevering efforts of Leopold the First, of Tuscany, against great physical impediments, a large portion of it has been reclaimed and made healthful and productive. The ancients labored under disadvantages which time has removed. They had no knowledge of the natural sciences, which

are the offspring almost of our own generation. Analytical chemistry has taught us the component parts of the soil, and of the plants and grains which it produces. We know precisely the amount of each organic and inorganic element which is lost to the earth in bringing a certain quantity of grain to perfection. We know that unless these elements are restored, the earth is robbed of so much of its vegetative power, and gradually becomes worn out and unproductive.

I have dwelt upon this subject, gentlemen, because it is the great danger which threatens our agriculture, and which we must guard against by timely reform, if we would fulfill our destined work of supplying the increasing wants of the Eastern hemisphere. I desire to give it prominence, because I believe there has been no instance in the history of our race in which the fertility of the earth has been so rapidly wasted. It would have been otherwise, no doubt, if we had not been able to resort to boundless tracts of fertile land in the West, which were open to emigrants at prices almost nominal. It was thought easier to wear out old lands and remove to new than it was to keep up the fertility of the old by manuring. It was a fatal error, as the condition of our agriculture shows. But for the extraordinary productiveness of the western States and Territories, the old States would, at this very moment, have been dependent on other countries for their supplies of food. The remedy for all this evil is in our own hands. It is to restore to our lands, by manuring, what we take from them in crops. We all know that this process of restoration has been going on for nearly a quarter of a century in Virginia, and that lands which had been worn out by successive crops of tobacco, corn and wheat, have been reclaimed and made to produce abundantly. It is estimated that thirty millions of dollars were added in value to the agricultural capital of that State, in twelve years from the commencement of this process of reform. The same results would follow the same measures in all cases in which the powers of the soil have been overtasked; and it is not doubted by those who have closely investigated the subject, that the crop of Indian corn might be trebled without enlarging the surface on which it is now cultivated, and that millions of dollars might be added to the annual value of that crop alone. Nor can it be doubted that the production of the other great staple articles of food might be augmented in a like proportion, increasing enormously the wealth of the country, and furnishing larger surpluses for exportation.

But it is time, gentlemen, that I should dismiss this general topic and turn to others which more directly concern the agricultural interest of New York. Let me, before leaving it, return to the proposition with which I commenced, and make a single additional observation in support of the concluding part of it,—that the increasing deficiency in the production of food in Europe can only be supplied by the United States. The remark I wish to make is this—that while labor is more abundant and cheaper in Europe than it is in the United States, we have three advantages which give us, and will give us for years to come, a decided superiority over the countries of the Eastern hemisphere.

1st. An immense region, unsurpassed in fertility, yet to be occupied.

2d. A more intelligent laboring community, constantly improving through the influence of a free and cheap press, and a social organization, which not only secures to every citizen the enjoyment of the fruits of his industry, but gives him a direct voice in the choice of his own rulers ; and

3d. The great extent to which machinery is employed in agriculture as a substitute for men, counterbalancing largely the advantage of cheap labor in Europe.

I do not venture to make an estimate of the extent to which mowing-machines, reapers and other substitutes for manual labor have superseded the latter in the cultivation of the soil in this country ; but I believe I am within bounds when I say that it is equivalent to five millions of men. These advantages must give us, in the competition for the European grain and provision market, a superiority over all other countries, and will make us, if we husband our natural resources with ordinary prudence, the granary of the world.

In leaving the general topic which I have discussed, and limiting our view to the State of New York, we cannot fail to be struck with the advantages which our farmers and agriculturists possess. First of all, we have, within our own boundaries, the emporium of the country,—not only destined, in all probability, to remain for centuries, the principal commercial city of the Union, for export, import, and distribution, but also to become the grain market of the World. It is a matter of the highest importance to our farmers to be so near the chief point of export and import, not merely because the expense of transportation is usually in an inverse ratio of distance ; but because great marts are always cash markets, and from the magnitude of their operations, and the accumulation of supplies for all the wants of men, they furnish readily, and at the lowest prices, all that the agricultural classes demand, in return for the products of their labor. Thus, the agriculturist is always sure of selling for cash his surplus produce, and of buying what he needs at rates which an extended and active competition is certain to reduce to the lowest standard. Artificial communication has greatly added to the value of this privilege. With the exception of a few sequestered localities, and these of very inconsiderable importance, the city of New York may be reached in twenty hours from the remotest district in the State.

The capacities of the State for agricultural production, arising from variety of soil, unequal elevations of surface, and diversity in the geological formation of different districts, may be favorably compared with those of any other State in the Union. A geographical district having throughout the same geological formation, and relying almost exclusively on a single class of productions, is much more in danger of suffering from unfavorable seasons than one, which, from the diversity of its surface, is enabled to apply its labor to a variety of products. In the former the failure of a crop may produce general distress, while in the other it would only be the cause of a partial inconvenience.

In the final report of the geological survey of the State, it was divided, with reference to its physical constitution and agricultural capacities, into six great districts; but, in a comparison of soils, on the basis of productiveness, they were reduced to five. Let us glance hastily at some of these divisions.

The western and central district, extending from the Mohawk to Lake Erie, and embracing all the intermediate counties, is in reference to the great staple production, wheat, the first in importance. Though the average product is much lower than it was when the soil was first reduced to culture, it is still over fifteen bushels per acre, and, in this respect, has maintained its productiveness better than any other portion of the State. One reason unquestionably is, that it is the most recently settled. But there is, probably, another cause to be found in the geological constitution of this district. It is underlaid in some portions by the Medina sandstone, rich in marls, and in others by shales and limestones, which, for the most part, disintegrate rapidly under the influence of atmospheric agents and resupply to the soil the mineral elements removed by the cultivation of wheat. It is in this point of view that the western and central district of New York may be regarded as one of the most reliable wheat-growing regions in the United States, and likely, with proper treatment, to remain so in all future time.

The great wheat-growing districts of the Union consist, for the most part, of prairies in the western states and Territories, some of which have been for centuries denuded of trees, and have yielded little else than grasses, by the decaying remains of which the soil has been constantly enriched. But whether with or without timber, the surface soil of these great plains is much the same. It is composed of the carbonaceous remains of decayed and decaying vegetation, and is usually of a depth, which, to persons unacquainted with the principles of vegetation, and their influence on the soil, would seem to give it an exhaustless fertility. It is for this reason, that the first cultivators have gone on, year after year, carrying away the produce of the land without giving anything back to it in compensation for the organic and inorganic elements which have constituted the food of the plants they have removed. The result has been everywhere the same. The crops have steadily deteriorated in quantity and quality. Experience has shown the expectation of undiminishing productiveness in new soils, no matter how fertile, to be a gross delusion. Science explains the cause of the deterioration. Vegetables, like animals, are developed by means of the food they consume. The former draw their sustenance directly from the earth. Every crop reduces the quantity of food the earth contains, and diminishes the conditions of its fertility; and, after a certain period, the capacity of the earth to produce the same crop ceases. In other words, the supply of food which the crop requires for its production becomes exhausted. There is but one mode of guarding against this result, and that is by restoring to the earth the same amount of organic and inorganic matters which have entered into the organization

of the crops removed. This is the universal law of compensation in every department of physical life. Chemical analysis shows that plants contain the same principal ingredients, in very different proportions. It shows, also, that soils, apparently similar, vary essentially in their chemical components, and that while one is better adapted to wheat, another contains, in more suitable proportions, the mineral substances required by other grains. If the cause of the deterioration of the wheat crop in this State, could be ascertained, it is probable it would be found that the soil on which it has been cultivated, possesses, in a reduced proportion, one or more of the mineral substances essential to the growth of that grain, and that if the deficiency were supplied the soil would possess the original fitness for its production. It is not probable that the counties on the North river and its vicinity will, for a long course of years, if ever, return to the cultivation of wheat to any great extent. The wants of New York, and of the large number of populous cities and towns which have sprung up in that portion of the State, call for an immense quantity of agricultural productions, many of which cannot be transported to great distances, and must, therefore, be produced near at hand. The question of remuneration will enter largely into the solution of every problem of this sort. A farmer who can raise two hundred bushels of potatoes on an acre of land, with a ready market for them at a moderate price, will find it more profitable than to raise thirty bushels of wheat on the same acre, at the highest market rate in times even of scarcity. Milk, fresh butter, green vegetables of all kinds, and animals for the slaughter-house, are among the daily necessities of great towns, and most of them must be raised or prepared for the market in the immediate neighborhood. Their production will absorb most of the geographical area of Long Island and the river counties. But the western and central portions of New York are beyond the influence of these daily wants, and the only question as to the continued cultivation of wheat will be, whether with the advantage of a market near at hand, they can compete with the wheat districts of the West, and sell at remunerating prices. I had occasion, some five years ago, to settle an account on the basis of the price of wheat at Albany, in May, for the twenty preceding years, and it was adjusted at the average of \$1.32 per bushel. I doubt whether, in any twenty consecutive years hereafter, it will average less. At this price, a crop of twenty bushels the acre will pay liberally. There is reason to believe that the soil of the wheat-growing district of this State is as well fitted for the permanent cultivation of wheat as that of the western prairies; for though the latter are so rich in humus, or the remains of organic life, they are less liberally supplied with the mineral substances which wheat requires, and which are, to some extent, furnished by the constant disintegration of the rocks on which the soil of the former district rests. In other words, if this supposition is correct, the former will, with the same treatment, produce, in a long succession of years, equally remunerative crops; and if the cultivation of wheat shall decline in this district, it will, probably, be from the growth of large towns in the western

part of the State, demanding, like the city of New York, a different class of agricultural products.

Though the other great districts of the State are less adapted to the growth of wheat, they have a peculiar fitness for other productions. The counties on the east of the Hudson, which were denominated in the final report of the geological survey of the State, the maize district, are, from the geological character of the underlying rocks, admirably adapted to the cultivation of Indian corn. The district constituting the southern tier of counties, while it is productive in corn and coarse grains, is more particularly fitted for grazing. And the same remark is applicable to the counties which skirt the western bank of the Hudson. Our mountains, with the exceptions of a few granite ridges and peaks, in the northern and southern highland districts, are susceptible of cultivation to their very summits. The eastern range, particularly, running as it does from north to south, is warmed on both sides either by the morning or the evening sun.

There are two great districts which have been considered nearly worthless, but which, I think, are destined to contribute largely to the agricultural production of the State. The first of these lies between the upper waters of the Hudson and Lake Ontario. It abounds in minerals and in timber; the valleys are filled with a rich vegetable mould, and the sides of the sharp peaks which rise to the maximum height of five thousand feet, are capable of producing the most luxuriant grasses. It is a cold region, and on its greatest elevation the snow, in backward seasons, lies unmelted even into midsummer; but beneficent nature seems to have distributed throughout all portions of her vast dominion, even the most inhospitable in their aspect, the substances which support vegetable life. The Swiss, leaving the valleys when the summer returns, ascend the Alps, almost to the elevation of perpetual snow, and building their chalets on the mountain sides, pasture their flocks and herds on narrow plateaus, which from below, seem inaccessible. Here, indeed, as in our knowledge of spiritual life, there is a limit to our progress upward. Man must not rise, even in the physical world, above his prescribed level. As we go up into the loftiest mountains on our globe, above the clouds, which God sends down to veil their summits from our sight, nature locks up her treasures of organic life in chambers of frost, and warns us by signs as significant as that which scattered the presumptuous builders of Babel, that our mission here lies nearer the lower surface of the earth. But within our appointed limits, everything is mercifully made to minister to our wants. Even the most refractory rocks are instinct with the principles of organic life, and are slowly but steadily yielding them up to the silent agencies of nature. The granite ridges of our highland districts, which seem so unchangeable, are undergoing perpetual alterations. Felspar and other constituents of granitic rocks contain, in large proportions, the substances necessary for the nutrition of plants. Frost, and heat, and rains, acting on their surfaces, are constantly breaking them up, and thus these huge masses are forever distilling like dew, into the valleys beneath, the elementary prin-

ciples of vegetable life. The cattle, if left to themselves, would turn away from the rank vegetation of the meadows and plains, and gather around the bases or the mountains, to feed upon the sweet grasses that spring up from the disintegration of their rocky breasts. It needs no prophet's vision to foresee that the valleys of this neglected district are to teem with waving grains, and that its mountains are to be covered, far up from their bases, with flocks and herds.

The other district, to which I refer, was called in the geological survey of the State the Atlantic district. It consists of Long Island, stretching out from New York harbor 130 miles into the Atlantic ocean. A most extraordinary delusion has prevailed in regard to the productiveness of the central portion of this district—a delusion natural enough with those who only know it by description; for one of the historians of the Island pronounced it “a vast barren plain” with a soil “so thin and gravelly that it cannot be cultivated by any known process.” And yet the surface soil of this whole region, with some inconsiderable exceptions, consists of a rich loam, from twenty to thirty inches in depth, easily cultivated, and made highly productive without immoderate manuring. Some of the best farms in the southern part of the State have, during the last five years, been made in this condemned region; and it is shown by the agricultural survey of the State that the Island produces fourteen bushels of wheat to the acre, considerably beyond the average of the State, and very little less than that of the western district. In a few places the gravel, with which the surface soil is underlaid, crops out, but these localities are believed not to exceed two per cent of the whole Island. I have been in the habit of visiting it in summer for twenty-five years, and have had the best opportunity of noting its productiveness. There are farms which have been two centuries under cultivation, and which, by good management, continue to yield abundant crops. Fields of corn, and of the most luxuriant grasses, run down to the very sand hills which the ocean throws up, as it were, to bound its own encroachments. Here too, as on mountains of granitic rock, nature is busy with her ceaseless transformations. The sand hills are no sooner thrown up by the sea than they begin to perform their office as a part of the solid earth by ministering to the sustenance of its inhabitants. Some weeks ago, while strolling over them, I was struck with the variety of the vegetation with which they were covered, and in a few minutes I gathered specimens of twenty-one plants, some of them in bloom, with colors as rich and delicate as any to be found in cultivated fields—and all within a stone's throw of the breakers.

“From these bleak sands spontaneous shoot

“Fresh forms of re-created life—

“The spear-shaped grass, the clustering fruit,

“Born of the elemental strife,”

The seeds, borne down by the rivers, or carried on the wings of the
wind to the ocean, lie for a while buried in the depths of the ungenial

waters; but when, in the progress of time, they are thrown out upon the sands in the warmth of the sunlight, and are fed by the liquid streams of ammonia, which are distilled from heaven in summer showers, they burst into life, and clothe the naked strand in verdure and beauty.

Of all the districts of the State, this has the finest summer climate, and the winters are mitigated and made temperate by the surrounding waters. Closer observation and successful experiment have dissipated misapprehension in regard to its fertility; they have shown that its soil is warm, genial, and productive; and there is little hazard in predicting that it will, at no distant time, become the garden of the city of New York.

Whether the agriculture of this State shall become what the natural capacities of the soil fit it to be, or whether the fertility of our land shall be worn out by overtaking them, and we become the dependents of other communities for our daily bread, depends on ourselves. I believe our whole duty may be comprehended in a single precept. Let us give back to the earth in manures and fertilizing substances as much as the earth can give to us in food. Nothing less will fulfill the universal law. Nature, which has decreed that no atom of matter shall be destroyed, has decreed also that nothing can be taken with impunity from any one of her great kingdoms without making compensation for it. The elements, of which the earth, the air, the sea, their inhabitants, and the vegetable world are composed, disappear and appear again under new forms: the substances which enter into the organization of plants, are consumed, and are converted into the flesh of animals, and when these decay, are given back to the earth to begin anew the same process of transformation; but not the minutest particle shall perish until the end of all created things shall come. To preserve the productiveness of the earth, nature only prescribes to us a conformity to her own law. Nothing is to be wasted or thrown away. The remains of all we consume, and of the food of our cattle, the portions of vegetable or animal matter which we reject as unfit for our use, are to be restored to the fields from which we have drawn our sustenance. The distinguishing characteristic of our husbandry is wastefulness. Every great town draws largely on the fertility of the country for its subsistence, and gives back little in return. The offal and the remains of all the animal and farinaceous substances, which are consumed by the city of New York, given back to the soil from which they are derived, would be worth millions of dollars a year in the productive power they would create. The time will come when a thorough reform will be made in this respect—when our great cities, instead of draining into the ocean and into rivers the remains of what they consume, will gather them up and restore them to the earth, the fertility of which they are gradually wasting.

In the meantime, let those whose high vocation it is to cultivate the soil, to preside over the sources of production, from which all classes of men derive their sustenance, bear in mind a few great truths. The farmer who stints his fields, is as unwise and improvident as he who starves his working cattle; in both cases he is diminishing the ability of a faithful servant

to be useful to him. The man who obtains from a field not properly fertilized, ten bushels of wheat, when by manuring he might have obtained twenty, is selling his labor at half its value. He who does not give back to his fields as much as he takes from them, sells their fertility in his crops; and the fertility of the soil is the farmer's capital. He who permits the remains of animal or vegetable substances to decay around him, instead of incorporating them with the soil, impairs the comfort and healthfulness of his home, and by a slow but unfailling process prepares the destruction of his farm, and the impoverishment of his posterity. The farmer who will keep these truths in view, and act in accordance with the rules they suggest, will find his compensation in the increasing products of his farm, in the augmentation of his wealth, and in the promotion of the general prosperity.

An admirable work, by Baron Liebig, entitled "Letters on Modern Agriculture," has just been published by Wiley in New York, and it would be well if it were in the hands of every agriculturist in the State. It enters largely into the subjects on which I have briefly touched; and it shows that practical agriculture and scientific chemistry, instead of being in conflict, as some matter of fact men suppose, are, in truth, mutually dependent on each other in the great work of reforming prevailing errors. It is the province of science to seek out and disclose principles and causes, and it is the business of practice to use the knowledge thus acquired to the greatest advantage for the common purposes of life.

Agricultural chemistry has rendered no greater service to the public than in showing the necessity of scientific training for the cultivation of the earth. It was a common opinion, a few years ago, that any man who could hold a plow, or use a hay-fork with dexterity, was fit to be a farmer. And yet his vocation is one of the most difficult, when considered in its numerous relations to the chemical properties of his fields, the influences of wind, moisture, and temperature varying in different localities, and the numberless causes which promote or obstruct the growth of plants. If there is any pursuit, which more than all others requires training, with some knowledge of the great principles which concern the fruitfulness of soils and the support of vegetable life, it is this. And yet, while we have for years had training schools for medicine, and law, and theology, we have, until recently, had none for agriculture, the basis of all human industry. This is a great social wrong, which we have only just begun to reform by the institution of a school in the western district.

But, gentlemen, I have already outrun the time which I had allotted to the performance of the duty with which you have honored me, and will hasten to a conclusion. I cannot do so without bearing testimony to the great service which this Society has rendered to the cause of American agriculture by its steady and its disinterested labors. The valuable information it has circulated through its annual publications for nearly twenty years on all the great subjects of practical husbandry, has given them new interest and importance, and the noble display of the last four days, in the

products of the earth, in animals, and in agricultural machinery, attests its eminent success, and the strong hold it has gained on the confidence of the community.

In conclusion, gentlemen, let me repeat my conviction that no State in the Union possesses in a higher degree than ours the elements of a varied and abundant production. On such an occasion as this I could do no more than glance hastily at the leading characteristics of some of the larger divisions of our territory, in their relations to certain classes of agricultural products. Half a century more will, I do not doubt, develop the peculiar fitness of each for the productions for which they are respectively best adapted by climate and physical constitution. Those who are to come after us, if we do our duty as faithful custodians of the productive powers of that portion of the earth which has been confided to us, will see the western district yielding, in undiminished abundance, its annual contributions of wheat, the eastern equally bountiful in corn and the coarser grains, the valleys everywhere teeming with varied productions, the elevated portions of the southern tier of counties, and the mountain slopes of the northern and southern highlands covered with flocks and herds, and the Atlantic district pouring its daily supplies into the vegetable and fruit markets of the great city. Before the nineteenth century shall have ended, the island of New York will be covered with warehouses, and workshops, and dwellings, with a population so full as to be incapable of further condensation. He who shall live to that day, and shall stand on the heights of Fort Washington—an elevation worthy of the immortal name it bears—the future central point of the wealth and taste of the great commercial capital,—will look down on a fairer scene than that which bursts on the sight from the plain of Sorrento, or the classical crest of Pausilippo. For he will look out—not over the sites of buried cities, or living cities abased by inaction and sloth, and on waters scarcely stirred by the keels of commerce,—but on rivers bearing on their bosom the mighty traffic of continents, and on cities and shores instinct with life, and liberty, and industry, and intellectual power.

His Excellency, Governor Morgan, offered the following resolution, which was unanimously adopted :

Resolved, That the thanks of the New York State Agricultural Society be most cordially tendered to the Hon. John A. Dix, for his very able and appropriate address; and that he be respectfully requested to furnish a copy for publication in the Transactions of the Society.

NEW YORK STATE AGRICULTURAL SOCIETY. ANNUAL MEETING.

WEDNESDAY, *February 8th*, 1860.

At 12 o'clock, the Society convened in the Assembly Chamber, and was called to order by the President, the Hon. A. B. Conger.

His Excellency Gov. Morgan, took his place among the members of the Society. Ex-Governor John A. King, was also present.

The treasurer, L. H. Tucker, read his annual report, of which we present the following brief abstract:

RECEIPTS OF THE YEAR.

Cash on hand from last account,	\$2,650 93
Life memberships during the year,	657 00
Other memberships do	75 00
Use of tent, 1858,	16 00
State appropriation for Dr. Fitch,	1,000 00
From local committee for Albany fair expenses,	1,200 00
Receipts of Albany fair,	18,111 33
State appropriation,	700 00
Total,	<u>\$24,410 26</u>

EXPENDITURES OF THE YEAR.

Premiums at winter meeting,	\$691 00
Expenses do	70 56
Salaries and traveling expenses (including Dr. Asa Fitch),	3,779 71
Library and museum expenses,	181 10
Premiums. &c., on account of previous fairs, ...	547 14
Postage account,	155 93
Incidental expenses,	175 81
Printing, advertising and stationery,	837 90
Expenses of Albany fair,	5,969 84
Premiums, &c., do	6,115 20
Survey of Onondaga county,	200 00
Cash on hand,	5,686 07
	<u>\$24,410 26</u>

*. The balance on hand, however, is subject to a still unadjusted claim on the part of the Albany local committee.

The Secretary presented the report of the Executive Committee, which was accepted and approved. Hon. Wm. Kelly, ex-President, from the select committee appointed to prepare a report in relation to the loss sustained by the Society in the death of Messrs. B. B. Kirtland, Joel Turritt and Anthony Van Bergen, made a report and presented a series of resolutions, which were ordered to be entered on the minutes, and, on motion of Governor King, adopted.

On motion of John A. Corey, of Saratoga, the usual committee of three from each judicial district was ordered to be selected by the members from the respective districts, to nominate officers for the ensuing year, and to recommend a place for holding the next annual exhibition.

The committee consisted of Prosper M. Wetmore, Edward G. Faile, A. D. Barber, from the 1st district.

John A. King, Queens; Wm. Kelly, Dutchess; Moses G. Leonard, Rockland, 2d district.

Wm. Newcomb, Rensselaer; Wm. Richardson, Albany; John S. Gould, Columbia, 3d district.

John A. Corey, Saratoga; L. E. B. Winslow, St. Lawrence; Hugh White, Saratoga, 4th district.

Henry Wager, Oneida; Eli Merriam, Lewis; A. Z. McCarty, Oswego, 5th district.

A. B. Diven, Chemung; J. W. Dwight, Tompkins; S. A. Law, Delaware, 6th district.

John Johnston, Seneca; H. W. Dwight, Cayuga; Daniel Warner, Monroe, 7th district.

G. W. Patterson, Chautauqua; T. C. Peters, Genesee; B. Van Horn, Niagara, 8th district.

The committee retired, and the Society took a recess during the session of the committee of twenty-four.

On reassembling, President Conger called the Society to order, and Gov. King, from the committee, reported the following resolution, which was adopted:

Resolved, That the committee recommend Elmira, as the place for holding the next fair.

The committee reported as officers of the Society for the ensuing year, the following gentlemen, who were duly elected:

President—Benjamin N. Huntington, of Oneida.

Vice-Presidents—1st district, John Jay, New York; 2d district, Chas. S. Wainwright, Dutchess; 3d district, Herman Wendell, Albany; 4th district, Calvin T. Hurlbud, St. Lawrence; 5th district, John Butterfield, Oneida; 6th district, Francis M. Rotch, Otsego; 7th district, James O. Sheldon, Ontario; 8th district, Theodore C. Peters, Genesee.

Corresponding Secretary—Benjamin P. Johnson, Albany.

Recording Secretary—Erastus Corning Jr., Albany.

Treasurer—Luther H. Tucker, Albany.

Executive Committee—A. B. Dickinson, Steuben; Ezra Cornell, Tomp-

kins; Charles P. Wood, Cayuga; L. Chandler Ball, Rensselaer; Samuel Thorne, Dutchess.

Ex-Presidents, ex-officio Members—Samuel Cheever, T. S. Faxon, A. S. Upham, Wm. T. McCoun, A. B. Conger.

T. C. Peters, of Genesee, from a committee appointed for the purpose, reported as follows:

The committee to which was referred the subject of popular lectures, to be delivered at the Hall of the Society, upon the plan lately adopted at Yale College, have had the same under consideration, and beg leave to report, that as the season is now too far advanced to make a satisfactory arrangement, they recommend that the Executive Committee take the subject into consideration, and if possible, take such steps as will ensure a full course of lectures during the ensuing winter.

T. C. PETERS,
DR. H. WENDELL,
L. H. TUCKER.

The Society took a recess until 7 o'clock.

The Society was called to order at 7 o'clock, by the President, Mr. Conger.

The evening meeting of the Society, held in the Assembly Chamber, was attended by a very large audience, amongst whom were to be recognized many of the oldest and best known members of the Society, and several of the most accomplished agriculturists of the State.

The first paper read was an interesting treatise on the Use of Manures in the Fertilization of Grass Lands, by Mr. J. Stanton Gould, of Columbia. The Society, immediately at the close of the address, passed a vote of thanks, and desired it for publication in the Transactions.

Dr. Fitch, the entomologist of the Society, next delivered an elaborate and very interesting treatise on the History of the Curculio, the inveterate foe of the plum. At the close of the address, the Society unanimously passed a vote of thanks to Dr. Fitch, for his valuable treatise, which will be published in the Transactions.

Mr. T. C. Peters moved that the Executive Committee be requested to apply to the Legislature for the usual appropriation of \$1,000, for the continuance of Dr. Fitch's survey. The motion was unanimously adopted.

Hon. A. B. Dickinson then made the inquiry of J. Stanton Gould, what his reasons were for stating that plaster was not profitable on clay soil.

Mr. Gould gave his reasons, which were replied to at length by Mr. Dickinson, who controverted the position taken by Mr. Gould from his own experience. He entered into an elaborate account of the culture of the cherry tree, and explained his mode of cultivation on his own farm. He had no curculios on his cherry trees. The plan he adopted was to cover his trees with soft soap in the spring. He challenged any person to go to Hornby and find a single nub or curculio on his plum or cherry trees. If he did discover one, he would pay his expenses and give him as good a din

ner as he conveniently could. He preferred the experience of practical farmers to the experiments of chemists, and declared the latter might as well search for needles in haystacks, as convince practical farmers that they know more about what the soil is fit for than does the man who works it. He advised farmers to attend more to their own experience than to the teachings of chemists, and to use their soil for what, from actual trial, they knew God had intended it for.

Mr. George Geddes, of Onondaga, said, that while he was gratified to listen to the honorable gentleman who had last addressed them, he had several times been on the point of calling him to order, because he thought that when scientific gentlemen were invited to deliver valuable addresses, from which all derived useful information, he did not think it right to open a free fight on their statements without giving time for all to reply.

Mr. J. S. Gould stated that he had practically tested the effect of plaster upon the clay, and found that it had no efficacy upon the *wet clay soil* of Columbia county.

The Society adjourned, to meet at the Agricultural Lecture Room, in the Agricultural buildings, on Thursday.

Thursday, a meeting was held in the lecture room—Chancellor McCoun, ex-President, in the chair. There were quite a number of farmers in attendance. The discussions were very spirited. Hon. A. B. Dickinson. Hon. George Geddes, Hon. Josiah Quincy, Jr., of Boston, Gen. P. M. Wetmore and others, took part in the discussions.

The exhibition of dairy and grain products, winter fruits, &c., was a very good one. The "Telegraph Churn," a new invention of T. A. Jebb, of Buffalo, attracted much attention. Butter was made in it of good quality, in from 2 minutes and 5 seconds to 3½ minutes. The report of the committee is given hereafter.

THURSDAY EVENING, 9th, 7½ P. M.

The Society was called to order by President Conger; and Mr. Johnson, Secretary, announced the premiums awarded.

The President then delivered the annual address—one of much interest—and at its close introduced, after some very appropriate remarks, the Hon. BENJAMIN N. HUNTINGTON, of Oneida, the President elect, who was received with much applause, and addressed the Society as follows:

Gentlemen of the New York State Agricultural Society:

I am sure, while there are very many who can discharge the duties of President of your Society better, that there is no one who can more truly realize the kindness which has prompted you to bestow this honor upon me.

I find it a pleasant service to assist the Society in its good work of endeavoring to aid the farmer to such culture of the earth as will give him a better reward for his labor, and a happier home. The distinguished gentlemen who have preceded me in this station have left an example of duty which I shall be glad to imitate to the best of my ability.

I know that those gentlemen associated with me in the management of your Society's affairs will be the most faithful of assistants, and will materially lighten my labors; and while the Corresponding Secretary continues in his present position, I think you will all agree with me that every concern of the Society will be promptly cared for.

You have recommended the place for holding the next annual fair, at Elmira; it is a portion of the State where the Society has only once held its exhibition; but the enterprise and liberality of that people is well known, and I feel assured that they will show to the State, that agriculture is not neglected in the southern counties of New York.

Gentlemen, I thank you for the honor conferred upon me, and enter on my duties, hoping most of all for your indulgence and friendly assistance.

Hon. Wm. Kelly offered the following resolution:

Resolved, That the thanks of the Society be tendered to the late President, for his valuable services to the Society during the past year, and for his able and instructive address, and that he be requested to furnish a copy for publication in the Transactions of the Society; which was unanimously adopted.

On motion of Hon. George Geddes, of Onondaga:

Resolved, That the Executive Committee be directed to institute such experiments, or to adopt such other means as they may judge best calculated to procure a more perfect knowledge of the effects produced by the use of Gypsum; and that will determine the best manner of applying it to the various farm crops.

The Secretary, on behalf of the Hon. S. A. Law, presented the following section from a bill before the Legislature, requesting the action of the Society in relation to the matter therein contained.

"No person or persons shall, at any time, within this State, kill any nightingale, night-hawk, blue-bird, yellow-bird, Baltimore oriole, finch, thrush, lark, sparrow, martin, swallow, or any kind of (the species of) woodpecker; nor shall kill any bobolink or robin, between the first day of February and the first day of September in each year, under a penalty of fifty cents for each bird so killed."

Resolved, That the Society approve of the same.

Gov. King, Chairman of the Board of Trustees of the New York State Agricultural College, addressed the Society, giving a brief history of the College, its present condition and prospects, and the need of pecuniary aid to put it in successful operation; and called upon the farmers of the State to respond to the calls which would be made upon them by Major Patrick, the President, and others. He introduced Major Patrick, who was received with much applause, and addressed the Society, on the objects of the institution, the necessity for it, for the benefit of the farmer himself, to adapt himself to the present state of agriculture, and in its commercial relations, &c.

He called upon the farmers present, who had for several years cordially taken him by the hand as they met him at our annual Fairs, to extend the

same cordiality to him when he should visit them, and ask them to aid in this great work of agricultural education.

After Major Patrick had concluded his remarks, which were most cordially received, Hon. Wm. T. McCoun, ex-President, moved the following resolution, which was unanimously adopted.

Resolved, That we will cordially receive the President of the New York State Agricultural College in our respective counties, when he shall visit us, and afford him every facility for the prosecution of his work, in raising funds for the institution.

The Society then adjourned.

B. P. JOHNSON,
Secretary.

ANNUAL ADDRESS

BEFORE THE SOCIETY, FEBRUARY, 1860, BY A. B. CONGER, PRESIDENT.

Fellow Members of the New York State Agricultural Society:

In the year 1791, at the Senate Chamber in the city of New York, the Hon. John Sloss Hobart in the chair, certain rules and regulations were adopted for the governance of an association, to be known as "The Society for the Advancement of Agriculture, Manufactures and Arts." Two years thereafter, and about the time of the establishment of the Board of Agriculture of Great Britain, a charter was granted to the Society, by the Legislature of this State, in which it is a source of high satisfaction to us, to recount the names of the distinguished men of that age, the tutelary genii of an infant commonwealth, enrolled in long array as corporators in this institution, and ever to be remembered as the foremost promoters of agricultural art and science. Those curious in such matters would not fail to notice the limitation in the act, imposed by the jealous care of the law-makers of that day, but which from our present point of view, seems to have been specially pointed in irony, that the clear yearly value of the real and personal estate, which the Society might thereafter acquire, should not exceed the sum of eight hundred pounds.

The first annual oration before this Association, was delivered by the late Dr. Samuel L. Mitchell, then rising with rapid strides to the zenith of his fame, as a physician and philosopher, to which we allude, not so much for the purpose of rehearsing his doubts as to the beneficial action of quick lime on soils rich in vegetable matter, his chagrin that "plaster, so much extolled by the Pennsylvanians, had failed so egregiously on Long Island," or his recommendation for the introduction into this country of the tamed Buffalo of Europe, as a beast of burden; but to accredit the clear and masterly manner in which he states the momentous question of artificial fertilization, and raises the inquiry whether much would ever be gained to our Agriculture from the introduction of the mangel-wurzel; questions still clamorous for an answer, and which have come down to us, bridging the span of nearly three-quarters of a century, fraught with a more imperative necessity for their solution.

This Society kept up a fitful existence, its names slightly variant under different charters which were granted, each for a limited term of years, until, under the act of 1819, it received the cognomen of the Board of Agriculture, and was quickened into the exertion of a new but transient

influence, by an appropriation of the sum of ten thousand dollars, which was mainly to be distributed among the County Societies. Provision was also made for the collecting and publishing of valuable information, in an annual volume to be distributed according to the wording of the statute among the good people of the State, the number, however, being limited to that of fifteen hundred. As long as the grants of Legislative aid were extended, these Societies maintained a prosperous appearance; but when denied, both parent and off-shoots dwindled and perished, as plants accustomed for a time to high and continued stimulus, when thrown upon the resources of their native sands.

But the good cause could not be overwhelmed by this general ruin, nor could the oblivious coldness of the powers that be, dishearten the friends of our profession. A few of the most zealous and enlightened of these came up to this Capitol, twenty-eight years ago, and instituted the Society whose name we perpetuate. Their aim, as expressed in their circular letter, was to resuscitate, and mainly as before, to encourage and promote the organization of County and Local Societies of Agriculture and Horticulture. Their modest hope was, that they might be enabled to embody the wisdom of their time, as well as direct its yearnings after a clearer insight into the economy of nature, through the columns of a journal to be recognized as the organ of the Society. They solicited communications of "well attested experiments and facts," from the tillers of the soil then in best repute, and expressed the belief that the fund so to be collected could "not fail to enrich, very greatly, the community at large."

The leading spirit of this movement was one who, at a mature age, had retained the large enthusiasm of his native land. A Frenchman by birth, he was the owner of large estates in Jefferson county—Le Ray de Chaumont—who, on assuming the first presidency of this Society, vindicated its choice in his election, as he bore testimony to the fact, that he then represented the only county society which had survived the general wreck. But the master-worker in the new association was one who, like Franklin, was a printer by trade, and had established, about the close of the last war, a newspaper in this city, for which he, for several years, maintained its claim as possessed of "an hundred eyes," while with constant vigilance and unclouded vision, he surveyed the political horizon of his day. After some years, vexed with the turmoil of the spirits he had summoned from the vasty deeps of political strife, he retired to pass the residue of his days on yonder hills, in practice and study, as a farmer. The reputation which he had thus gained, was soon merged into that more extended renown, acquired as the Corresponding Secretary of the Society, and the Editor of the Albany Cultivator, and his stores of learning, ever diffused and ever cumulating, treasured up in the pages of that journal, and inventoried with scientific skill in the treatises he subsequently published, have won for him a distinction so high, that he may be ever appropriately regarded as the Jethro Tull of American husbandry. Need I say in the presence of those who sympathized and assisted in his labors in the early up-building of this

Society, that I seek to commemorate the virtues and the fame of the late Judge Buel.

By the methods I have indicated, and chiefly by that of maintaining its position as the patron of the local associations, the Society was gradually obtaining the confidence and respect of the great body of our farming community, and was perfecting its scheme for a more thorough and extended usefulness, until it had fulfilled the novitiate prescribed by the satirist of the Sabine Farm, for the full development of all human conceptions and plans; and at its annual meeting, in 1841, expectant of the encouragement to be permanently offered through the munificence of the Legislature, it engrafted on its previous scheme of exhibitions of industrial products, (which you will bear in mind, were restricted to the limits of each county,) a plan which gave it reality and life, as a State institution. The resolution to hold annual fairs, in which the farming and manufacturing resources of the entire Commonwealth, might be represented, met with no dissenting voice, the Constitution of the Society was amended accordingly, and at once its unprecedented career of prosperity opened before it.

As we thus recall the time and occasion which ushered in for us such a series of signal successes, we may not be forgetful of those which were precursive of it, and when, in conformity with a usage sedulously cherished from the earliest days of our Society, we are here convened to celebrate, under its present Constitution, its twentieth anniversary, we may be reminded that it is the twenty-ninth of the old style, and that we have for our assembling to-night, a sanction as grave and as authoritative as that which an unremitting service to the public welfare, paid by us for more than a quarter of a century, and by those who ministered before us for the half century preceding, can confer, and a memory and a fellowship, now growing ancient and venerable, claiming an older birth than that of the proudest of our Anglo-Saxon compeers, the Royal Agricultural Society of England.

And without boasting, we may add, that we possess a heritage as rich in the natural resources of farming wealth, a field for experiment and operation, as varied and as extended; have made with far less of patronage showered upon us, or the body of farmers we represent, achievements in practical skill and science, applied to our art as illustrious; command an influence as remotely felt, and as universally conceded throughout the civilized world; and enjoy a fame as bright and as enduring also, we trust, as theirs.

But time has not circled our name with his wreathed years, without exacting his tribute. His last chaplet has not been added, ere he had gathered three of our most estimable associates; one* who twenty years ago presided over our councils with his wonted benignity, and two others who actively participated in our labors and aspirations, the one† as Vice-President from the fifth district, and the other,‡ charged with our fiscal cares

* Judge Van Bergen, of Coxsackie.

† B. B. Kirtland, of Albany.

‡ Judge Turrill, of Oswego.

for many years. It would be futile to attempt to measure the impulse given to our then uncertain destinies, by the calm courage and the trustful work of our venerable President, or to estimate the co-operative influence of those later associates, who now share his rest and honors. Good men! brave and useful men! their doings are written, and their memories will be embalmed in our chronicles.

But if lamentingly, we are constrained to cry out, "The Fathers! where are they?" it is not with a corresponding solicitude that we raise the inquiry, "the sons, the successors, where? what are they?" For here they are about us, responsive to our call, and in obedience to our behests, ready to take upon them their share in this great work, thoughtful alike of the memories and attainments of those who have gone before us, and sensitively alive to the responsibilities which cluster about their accession.

We stand now where, for a moment in our existence, our past and future seem, as by a spell from some magic wand, lapped in the embrace of the present. And if, while we review the work accomplished, and scrutinize with earnest and resolved gaze that which remains, to an observer outside of our circle, it appeareth as a mere hallucination, and the wonder is passing strange that the inauguration ceremonies do not proceed, that the incoming administration seems to cling to that about to retire, as if loth to let it go; or that reversing the rule ordinarily adopted in the conduct of human affairs, that which is itself dissolving is tracing the path for that which is just assuming the direction of an executive trust; let him remember that under these forms of change the labor abideth, and is sustained as cheerfully in the humblest as in the foremost ranks; that whatsoever is prosecuted with success, is directed in its first steps by a wise forecast, and that in the bonds of a fraternity constituted as ours, there is neither the aspiration for, nor the exercise of power.

Our Society sustains its beneficent relations to the community of farmers, and to the Agricultural world at large, under a twofold office. The one is annually fulfilled in its great exposition, where its wealth of offerings is revealed for the instruction, and displayed to the admiring gaze of the million. The other is more equably administered through its Executive Board at the regular sessions, consisting partly in the maturing of its preparations for the first, but mostly in the consideration of methods best adapted for the discovery of new truths, or the rescue of the old from neglect and disuse, and for their proof and reduction to the necessities and contingencies of the farmer's life. Now, while it would be quite impossible to pass all or the greater part of these topics under review, within the limits prescribed for such an address, a few will be selected as bearing upon the business or material interests of our Society, and some theoretic views stated, some practical inferences suggested, touching questions of no light importance to Agricultural Science.

Our late Fair has received its full meed of praise, which it is far from my purpose at this time to seek to enhance. As by general consent, there has been accorded to it the credit of an unparalleled success, you will indulge

me in saying, that my own personal recollections hinge principally upon its general and pervading harmony. A show, well balanced in all its proportions, with an arrangement of the ground and location of structures, which expressed a long sought desideratum in our councils, it welcomed under a benignant sky, its throngs of exhibitors and judges, visitors and attendants, who participated in, and in turn cordially ministered to the general satisfaction and service. In fact, not only among our own people, but with guests from sister sovereignties, the feelings of delight manifested were unalloyed, save perchance by a sense of surprise at the extent and magnitude of our preparations, and their completeness in all their parts. But when I consider how nearly the serenity of our enjoyment was being marred by an outbreak which at one time it was feared might have become riotous, I cannot but advert to its cause as far, at least, as the limits of delicacy on such an occasion permit, in the hope that by attracting attention thereto, the Society may in future be relieved from any danger of its repetition. The lessees of certain booths erected near the main entrance to the Fair, claimed the right of selling spirituous and fermented drinks in them, by a right anterior to the possession, as yielded to the Society, of the grounds, and not only so, but by removing some of the boards, which separated these booths from the interior of our enclosure, sought to make sale to persons within the same. This was not only contrary to the statutes of the State, but in contravention of the positive rules and the established usage of our Society, and threw upon it the necessity and expense of increasing its police for the enforcement of its regulations. There ensued, what I think I do not over-estimate, the risk of an imminent and deadly breach of the peace, which it was believed by those associated with me, was only prevented by the exercise of the powers granted to the officers of the Society, under a late statute. Now, while it may be easily conceded that the farmers of this State, who have so uniformly banished this perilous stuff—this deadly pest—of intoxicating drink from their farm service, have a right to be secured against its intrusion at their annual festive gatherings; I may further insist, and this is the point I especially desire to make, that the localities, through their committees and principal citizens, who from time to time may invite the Society to hold its Fair on the ground provided by them, should use every precaution against any infringement of the laws, or of public decency, and take also upon themselves every reasonable responsibility of securing through their local magistracy, the summary punishment of offenders; and this as a matter of honorable courtesy to the officers of the Society, who coming in the midst of them as guests, should neither be detailed to the suppression of local disorders, or by contingency summoned as witnesses in any prosecution arising therefrom.

I urge, then, that the Society should receive ample local aid, not only in the observance of the rules adopted for the rigid exclusion of intoxicating liquors as a beverage, from within the enclosures of its fair grounds, as well as the enforcement of the statutes of the State in all that approaches

to the same; but also in everything which militates against the public peace, or threatens the welfare or the lives of the thousands brought thither, who as the Society, may claim a hospitable protection and care.

On grounds of a like public morality, I may insist that the conditions in the bond and agreement given to the Society by the local committee in regard to the completion of all arrangements touching the Fair, and especially of the structures for the reception of cattle or goods to be exhibited, should receive a full compliance, and that by the day appointed. On no pretext of haste, or of excuse for some improvidence, should the sound of the hammer ever be heard on the Sabbath, in the work of such erections, and if exhibitors do not make their entries within the time specified in the Society's poster, so as to give ample notice of any further accommodations required, they should expect no protection against their own indifference or heedlessness, which might involve, on the part of the Society, its officers or agents, a violation of the day of rest.

The policy of the Society in regard to the rotation of its Fairs, is believed to be securely established. As the King's court of old, of which it was boasted that it brought justice to every man's door, so our Fairs bring the advanced knowledge of Agricultural and Mechanical improvements into the different neighborhoods of the State. And as it is their principal object to diffuse among our farmers the knowledge of our accumulating improvements as widely as possible, so it is necessary to gather about their exhibition the greatest number possible of our Agricultural population. I therefore recommend, that in future our railroad and other companies engaged in the transportation of persons, be solicited to issue, as in former years, to those attending our Fairs, excursion tickets. These have heretofore induced many to visit our exhibitions, who otherwise would have remained at home, and will not only increase the receipts of these companies, but also those of the Society. And this last is a consideration of no light importance to its future and permanent interests. Though so long established, it has accumulated nothing, and owing to the large expenditures at our late Fair, principally those connected with the Police Department, the surplus left from receipts, greater than ever before, will be, beyond expectation, light. But it is hoped that with economy judiciously administered, and in the observance of those prudential measures previously indicated, which will lighten the burden of protecting the property of exhibitors, and maintaining the public order, the Society will, by increasing its annual receipts, be able to lay aside not only enough to make up the deficiencies of an unfavorable Fair, which has heretofore been its highest financial aspiration, but a sum whose interest alone will be sufficient to protect it against any such disasters. I know it has many excellent friends who have thought that sound policy required that it should amass nothing except at intervals, but I believe that on reflecting upon the financial condition of our Commonwealth as it may possibly exist not many years hence, they will yet conclude that it would be wise to place this Society in a position so independent of legislative or extrinsic aid, that it

may nowise be cumbered in its beneficent operations, and that its premiums in money and plate may rank with those offered by any Society in the Union, and may then in general estimation be of a value co-ordinate with that heretofore universally conceded to its diploma.

If the brief outline of the early history of our Society, which I attempted at the opening of this Address, is not without its interest to those pleased with antiquarian researches, it is also not without a valuable lesson to us, and to all associated in the advancement of Agricultural pursuits. It has, I trust, with reference to the influence of Societies constituted as ours, demonstrated satisfactorily the importance of Fairs, and that without these they could maintain only a brief and chequered existence. Whether annually or biennially or at longer interval, these exhibitions serve to keep alive the connection of our Societies with the great body of the people, and to give palpable proof that their interests are identical with ours. The suggestion, it is true, has been brought forward in certain quarters that a Society representing an extended interest might exist as a bureau of Agriculture, but it could only maintain its being by governmental patronage or immense endowments, and then it would be a most arduous task to diffuse its influence or establish its relation with the masses it sought to benefit.

Our Society has an abiding, a *home* interest in the work of speeding the plow within the limits of our own State, and of arresting and furnishing the sufficient corrective for that alarming deterioration in our Agricultural products, as observed by the census reports from 1845 to 1850, and still believed not to have entirely ceased. I had intended to draw your attention to some of these items of diminished production in detail, and to reiterate the assurances submitted by a late President,* for a more energetic and thorough tillage, as furnished in the superiority of our home markets over those of the great west, with reference to the transit to our Commercial Emporium of cereal products for foreign consumption; which in a natural state of things, represents the interest of at least fifty dollars per acre, as the advantage which every tillable acre of our State has over any lying west of the lakes, facilities of transportation to the great routes of travel being equal; but the vexed discussion in other quarters of topics intimately connected with this, forbid any more explicit allusion to it.

I may, however, say in reference to this subject of diminished production, that it was with no little interest I marked the great sensation produced at the opening of our session, in the reading of the report of the Executive Committee, who reviewed the alarming statistics from the Agricultural Report of the State of Ohio of the destruction of sheep—one-eighth of a million in number—in the previous year, and that by marauding kennels of dogs. Such a statement is well calculated to send a shudder through the breast of any disposed to the study and practice of a true economy; but fearful as these figures are, they are but the shadow of those which ascertained, as by the census previously referred to, the dwindled sheep-flocks of the farmers of this State.

* Judge Cheever, in his annual address for 1855.

Three millions of sheep in five years, or at the rate of six hundred thousand per annum, is the story of their thinning out, and though it may be insisted that but a fraction of this number was taken off by unleashed whelps, yet it cannot be concealed that their incursions lie at the basis of the discouragement and decline of this husbandry. Knowing that it is the most profitable branch of feeding which the farmer has, whether for quick returns of moneys invested, or for the manurial wealth accumulated in the fold, and that in connection with root-culture, it is the main hope we possess for the restoration of our soils, even to its ancient standard of productiveness, it is quite unaccountable, that such supineness on this subject is manifested by the representative farmers in our Legislative Hall. Interests that might be indicated commercially by millions of dollars, and agriculturally in the facilities afforded for a higher tillage and a maximum yield, by as many millions more, are not only jeopardized, but wholly disregarded; as if the howl of curs was more grateful than the bleating of flocks, and the design of improvident legislation by an inefficient tax, was to let these disturbers of the night and burglars of the farm-yard, pass yet a little longer unwhipt, or pardon me for saying, unhung of justice.

I shall draw but briefly on your patience in noticing the last of those topics, affecting directly the outward material interests of the farmer which I purposed to review, the subject of steam-culture. This has engaged the serious consideration of our Society, and commanded its highest premiums. I may safely speak the general sentiment of our Board, when I say that in a mechanical point of view, the ponderous instruments heretofore brought forward, are as averse to our system of tillage and our wants, as the massive unwieldy implements of husbandry projected and in use in the old world at least a quarter of a century ago, if not more so; and that in a scientific point of view, the turning over of furrows is not a desideratum, as the later researches of our chemists prove that what we need, is the thorough commingling of the particles of the soil, so that in the chemical play between them when brought newly together, the mineral food of the plant may be best supplied.

This admixture and juxtaposition we now best attain by spade husbandry, and this should be imitated, if not improved upon, in any new mechanical contrivance for the application of steam to the comminution and deepening of soil, by a rapidly rotating motion, instead of a slow uplifting overturning movement. On this subject nothing can be added for the guidance of our mechanicians to the clear and comprehensive statement presented by my able and illustrious predecessor.*

But let me pass to the other themes proposed, more congenial to the taste of such as study nature in those various moods in which she hides herself from the untutored eye. As briefly as may be consistent with their due presentation, I will offer some considerations on the physiological laws which promote the growth and maintain the vital functions of plants, and which seem to be expressed in the selection and assimilation of their food

* Judge McCoun, in the Address of 1859.

I may bespeak, then, your especial attention, while essaying to bring to your notice a theory in regard to the motion of fluids in plants, first propounded more than a century and a quarter ago, and which has lain comparatively dormant until restored, about ten years since, to the arena of scientific thought by the illustrious sage of Munich. In the year 1727, Stephen Hales, a Kentishman by birth, and a clergyman by profession, published a treatise entitled "Vegetable Statics," in which, by methods of observation and induction, applied with eminent success, he demonstrated that the motion of the juices of plants could not be accounted for by the forces of capillary attraction, but was maintained, and might be measured, by the evaporation going on from their surfaces above the ground.

Starting with the premise that men would discern more of that regular and orderly economy, which the divine architect has impressed on all the works of his hands, in the use of the faculties by which they are enabled to "number, weigh and measure" those parts of the creation which come within their observation, he proceeded, in a series of carefully conducted experiments, so to measure and weigh the appropriation as well as the elimination of fluids by plants of various kinds, that by comparing the results so obtained, he was able to deduce certain general laws, which, coming down to us from the age of Newton, reprove most of the subsequent investigations into the laws of vegetable physiology, by the evidence they furnish of a more masterly method.

In the first experiment, conducted with a sunflower of three and a half feet in height, to ascertain the quantity imbibed and perspired by it within stated times, he found the mean rate of perspiration in twelve hours of a warm dry day, from July to August, to be twenty ounces, or thirty-four cubic inches of water; and that perspired during a dry warm night, without any sensible dew, to be about three ounces; while, if the dew was barely perceptible, the perspiration was nothing, or if heavy, or its precipitation was increased by rain, the plant and the pot in which it was contained, were increased in weight. By a very ingenious process, he measured the leaf surface of the plant, which he found to be over fifty-six hundred square inches, and by a like method, determined the absorbent surface of the periphery of the roots to be nearly twenty-three hundred square inches; so that the proportion of the leaf surface to that of the roots, was as five to two, a proportion which also expressed the ratio of the velocity with which water entered the surface of the roots, to supply the expenditure of perspiration, to the velocity with which the sap perspired. The area of the transverse cut of the middle of the stem being a square inch, if it were entirely hollow, the velocity with which the fluid passed through it would be expressed by 34 to 12, the number of its cubic inches and of hours occupied in its transmission; but inasmuch as the stem, when dried, was found to waste three parts of its entire weight, its woody fiber was believed to fill up, at least, one fourth of its area, and thus the ratio of such velocity would be increased one-third, and stand as $45\frac{1}{3}$ to 12. But if, as suggested, in his third experiment with a vine, the sap rises under the action of the heat of

the sun, in a vapory form, this ratio may be increased tenfold, and stand as 37 to 1. Comparing the perspiratory surface of this plant, which weighed only three pounds, with that of a healthy man weighing one hundred and sixty pounds, he found that it was two and a half times greater; that the plant transpired seventeen times more bulk of food, though only two-sevenths in weight, and that the rate of perspiration for equal surfaces and equal times, was, as between the man and the plant, as ten to three. This great excess in the man, being accounted for by the greater heat of his skin than that of the plant surface, the query is raised, whether the sum of the areas of the pores lying in equal surfaces in the man and sunflower, must not be as sixteen to one, and the conclusion is hinted at as probable, that many of the distempers to which plants are subject, are owing, as in the case of animals, to a stoppage of their perspiratory functions by an inclement atmosphere. I have been the more willing to give this abstract, in order that not only the method with which Hales started, but the manner in which he applied it in this and all his experiments, might be appreciated, and serve as a guide to any future investigation of this kind, which, with the more delicate instruments possessed by us, would, no doubt, render the expression of these numerical ratios more exact.

Noticing only at present in the intermediate experiments made with plants of the most diverse characteristics, the fixed relations in each plant between the root and leaf surface, which make necessary the reduction of the latter by lopping off branches in transplanting, unless this is so carefully done as not to cut off any of the delicate fibers of the roots; also, that the leaves of evergreens have a less capacity for evaporation than those of deciduous trees; and also that fruit has an exhaling power proportionate to its surface, as compared with that of the leaves, we rest for a moment, at the 10th and 11th experiments, by which the evaporative power of the leaf surface is more clearly exhibited, and from which the conclusion is drawn, that the motion of the sap is at least in its proximate cause principally dependent on this power.

Hales took an apple branch, three feet long, and one-half inch in diameter, full of leaves and lateral shoots, and to it hermetically fastened a tube seven feet long and five-eighths of an inch in diameter, and having filled the tube with water, he immersed the branch completely in a vessel of sufficient capacity and full of water. On the third day, in the morning, the branch was taken out and hung, with the tube affixed and newly filled, in the open air. The results were carefully noted as also those of similar experiments at different times, by which he was enabled to see how little was perspired, in a rainy day or when there were no leaves on the branches. In comparing these results, we find that the water was imbibed and exhaled by the branch with the leaves on and in the open air, with a velocity nearly one hundred times greater than when it was submerged in the water. Having cut off a branch similarly connected with a tube, thirteen inches below the same, it was placed in a vessel having a known quantity of water in it, and it resulted that in thirty hours it absorbed three times as much

as was forced through the grosser part of the stem, fastened to the tube by the constant pressure of a column of water seven feet in height.

In his twenty-first experiment, at a period of considerable drouth, he laid bare the root of a thriving pear tree, digging down to the depth of two and a half feet, and having cut it off, he cemented the stump which was one-half inch in diameter, to a glass tube, and this having filled with water, he immersed in a cistern of mercury. In six minutes the root had imbibed the water with so much vigor, that the mercury rose in the tube eight inches, which corresponded to a column of water nine feet in height, and was found by Hales, in his later hæmastatical researches, to be nearly equal to the force with which the blood moves in the large femoral arteries, or even the carotids of the horse, and one and a half times greater than in the like currents of a sheep or a dog. In this, as in subsequent experiments, he found that the height to which the mercury rose, depended upon the heat of the sun communicated to the leaves and stem, and upon the hygrometric condition of the atmosphere; that the absorbent force was diminished by any injury to the plant, and was greater in a fresh cutting, whether of root or of branch, than in one exposed to water or air for any length of time; that this force was not necessarily dependent upon the vessels in the inner or outer bark, for when these were entirely cut away, the leaves and twigs still absorbed and evaporated water through the residue of the stem; and that the measure of the force as given in his experiments should be increased about one-third, inasmuch as he discovered that the absorbent power was diminished by the expulsion of particles of air from the plant into the tube into which it was cemented.

It is highly probable that this gas was oxygen, liberated by the action of sun-light from carbonic-acid gas, which, as recent investigations in vegetable physiology prove, is formed in every portion of a vegetable structure—as well that encased in the soil as that surrounded by the atmosphere—and of course implies a power in the evolution of this gas, as of pressure against the walls of the cells in which it is formed. This power acting in conjunction with the evaporation of watery particles from the surface, giving rise to a partial vacuum in all the vessels of a plant near the same, is thus accelerated by the pressure of the external air, and both, when in play, are constantly operating, the latter as the paramount force in the propulsion of the fluid contents of every plant, from its absorbent to its eliminating surfaces.

One of the most practical applications which Hales made of these conclusions, was in explication of the causes of the hop-blight. In the year 1723, he says, “when ten or fourteen days’ almost continual rains fell about the latter half of July, after four months’ dry weather,” the most promising vines “were all infected with mold or fen in their leaves and fruit, while the then poor and unpromising hops escaped and produced plenty.” As confirmatory proof of the views he presents on this subject, he further says, “this rain on the then warm earth made the grass shoot out as fast as if it were in a hotbed, and the apples grew so precipitately,

that they were of a very flashy constitution, so as to rot more remarkably than had ever been remembered." Hales had, in his ninth experiment, shown the wonderful power of absorption of water, which the hop-vine possessed, and had calculated that the amount consumed in every twelve hours' day, independent of what passed from the surface of the earth, were for every acre "an area of liquor as broad as an acre and one one-hundred and first ($\frac{1}{101}$) part of an inch deep.

When, then, with such enormous power of absorption (a constitutional peculiarity of this and most annual plants), the atmosphere was itself heavily laden with moisture, the power of throwing off the fluids taken up so rapidly was checked, "the kindly perspiration of the leaves" was hindered, and the sap stagnated and speedily corrupted, as he has shown when condensing perspiratory vapor in glass retorts to be readily effected. On like principles he accounted for the fire-blast, the explanation being similar to that which gardeners have formed into a practical rule, when they avoid putting their bell-glasses over their cauliflowers early in a frosty morning, before the dew was evaporated off them.

Hales had observed the vines in the middle of a hop ground all scorched up, when a "hot gleam of sunshine has come immediately after a shower of rain; at which time the vapors are often seen with a naked eye, but especially with reflecting telescopes, to ascend plentifully," and there being no "dry gravelly vein in the ground along the course of this scorch," the vapors forming a dense medium acted as lenses over the surface of each plant, and so by wilting it and contracting its pores deprived it of its evaporating power. From these experiments and deductions of Hales, you may readily apprehend the conditions under which plants can maintain a healthy condition; you at once infer the necessity of drainage for the purpose of removing too large a supply of fluids from the roots as well as of absorbing a temporary excess in sudden showers; that mold or fen fungi or excrescences indicate an abnormal supply or circulation, and that a sudden loss of vitality in plants proves a "suppressed transpiration" of their fluids.

It was reserved for the quick eye of a Leibig to make application of these views to a just theory of the potato rot, which he says has been known to the oldest peasants from their youth, and was accurately described by Parmentier, who introduced this esculent into France; and if the physiological inferences of Hales are applicable, then the remedy for this terrible disease must be sought in the condition necessary for the avoidance of either a vehement blasting or of a stagnation of the pabulous currents in the plant. As by the gradual removal of our forests and the exposure of large undrained surfaces to the action of winds and summer heat, we are liable to be visited with sudden showers during the time of the maturation of this root, followed immediately by the fierce blaze of the caloric beams of an almost meridian sun, it will be necessary, not only to secure thoroughly drained land for the cultivation of this crop, so that these hasty showers may be mostly drunk up by the warm and aerated earth, and no con-

siderable portion of them be converted into vapor, which may invest the plants as with mirrors to refract the parching rays upon them, or which may by a process of suffocation concentrate their juices in the cells and so ensure decay; but as we venture to suggest, to plant this crop in alternate rows with some other crop, having a greater capacity for absorbing moisture, or for resisting the process of suppression of the respiratory function, or the scorching power of sun-light, and furnishing withal a shelter from this last under its shadow. It is believed that the Indian corn or sorghum might prove efficient in this manner; at any rate the trial with these or other intermediate plants should be carefully made. It may be as in the interstitial fallows of the Lois-Weedon husbandry, so much vaunted for productiveness by its inventor, that a more thorough ventilation of the crop may be effected, tending to lift stagnating currents of vapor, as well as heavier dews secured, by presenting surfaces of unequal capacities far absorbing heat.

It will suffice in order to prove the general law, as asserted by Hales of the causes which govern the motion of the fluids of plants, to allude to what might seem to be an exception to the general rule, the rise of sap or saccharine juices in the vine, the maple or birch trees and the like, before the leaves are fully developed.

In his thirteenth to his fifteenth experiments, Hales tested the power of capillary sap vessels in various ways. He showed that a cylindrical section of a vine, as well as of an apple branch, when placed in water, continued for some days to exude a moisture from its upper surface, but could not raise any appreciable column of water, and repeating this experiment on a tree which he had cut off two and a half feet from the ground, separating it, by this act, from all its twigs and leaves, obtained the like result, which was not varied when he dug up the trunk with its roots and placed them in a vessel of water. But had the leaves been spared, the result would have been wholly different, whether as previously shown, the section, the upper part of the tree, or the tree itself had been placed in water; or whether the bark had been removed inner or outer, or both, in whole, or in part as far as immersed in the water; or whether, as also appeared, the section or branch had imbibed the water in the natural way from the greater to the less end or *vice versa*. In his sixteenth experiment he satisfied himself that, contrary to received impressions, sap rose in the winter, although in comparatively inappreciable quantities, as he found that cuttings of filbert suckers, vine branches and of some evergreen plants, when the transverse cuts were dipped in melted cement, "so as to prevent any moisture evaporating through the wounds," lost in weight, during an average period of eight days, from the one twenty-fourth to the one-third part of their weight, a waste which may be regarded as the index of the insensible perspiration they would have undergone had they remained in their natural connections. It is quite remarkable that it was the vine cutting that had lost the least, but the wonder subsides when we learn more of the idiosyncrasies of this plant. In the thirty-ninth experiment a vine stem which

exhibited no indication of being expanded or contracted by heat or cold, in the bleeding or in the non-bleeding season, was affected by outward moisture, showing, as Hales says, "that the sap (even in its bleeding season) is confined in its proper vessels, and then it does not confusedly pervade every interstice of the stem as the rain does, which entering at the perspiring pores, soaks into the interstices and thereby dilates the stem." Supposing, then, by a peculiarity which makes the sap in the vine and in all bleeding trees to flow at certain seasons in larger quantities than are observed in other plants, it rises to seek its natural perspiration at the points in the outer bark where the leaves are in embryo, and as these are being developed the insensible passes into a more copious transpiration; we can understand why it is that when the trunk is completely severed near the root, during this flow, the copious current is neither arrested nor absorbed by the little that is left of the perspiratory medium, but is exuded until arrested by the care of the vine-dresser, or death ensues from exhaustion.

The different phenomena observed principally during the bleeding season, as following the section of thriving shoots, or the entire severance of the stem, are stated in the thirty-fourth to thirty-eighth experiments. In the latter case the mercury rose from fourteen as high as thirty-eight inches, while in the case of three branches of the same vine, cut at different lengths and at various heights from the ground, the several columns ranged from twelve to twenty-six inches; the same general law as to the manifestation of the favoring influences of warmth and a dry atmosphere in the evaporative surface being fulfilled, and undulations also noticed as verifying the difference between an imbibing and a pulsive force.

Having observed "that in very hot weather, many air bubbles would rise, so as to make froth an inch deep, on the top of the sap in the tube," Hales affixed a small air pump to the top of a long tube, which had twelve feet height of sap in it, and he says, "when I pumped, great plenty of bubbles arose, though the sap did not rise, but fall a little after I had done pumping." Hales supposed that these bubbles were composed of atmospheric air, drawn in through the roots; but late analyses have determined their true nature, and have also explained more satisfactorily what Hales ascribed to a general attractive force, which he supposed to reside in all the parts of vegetable organisms. We now know that the sap of the vine is very rich in carbonic acid, and that this is readily disengaged at a moderate temperature by the fermenting action of the nitrogenous contents or lining of the cells, on the saccharine particles of the sap, and we may conclude that its great vernal flow is in the main to be measured by the tensile power of the carbonic-acid gas, when being disengaged in the cells of the plant, and operating upwards against a partial or entire vacuum, unless when all the branches are cut off, and then simply against the weight of the atmosphere.

It was when this gas was removed from the column of sap by the air-pump, that the sap fell. And when as the development of the shoots com-

mences, "and the surface of the vine is greatly increased and enlarged by the expansion of several leaves, whereby the perspiration is much increased and the sap more plentifully exhausted, it then ceases to flow in a visible manner."

But I may not further dilate. If this attempt to bring to the notice of our farming community, the views of this admirable thinker on this great fundamental law of the vegetable economy, seem too elaborate, my apology must be found in the desire to present them in such a way as not merely to attract attention to them, but to excite to observations and a thoughtful study after the same exemplar.

It is difficult to realize the fact that a man universally acknowledged as one of the brightest ornaments of the Royal Society, during the eighteenth century, whose inventive talents planned ventilation for hospitals and prisons—whose benevolence, not manifest alone in parochial duties, distinguished him as an apostle of temperance for his times, and whose "Statics" was honored in its introduction to the savans of France by one of no less eminence than the Count de Buffon, should in this age for himself or his discoveries in vegetable physiology rarely receive mention in the standard treatises on that subject. In such a state of things it is not so wonderful that a century after Hales had explored the sources of the vital movement in plants, Dutrochet should claim as its immediate cause, a force residing in structures named spongioles and supposed to be found in the extremities of the radical fiber. Groping in the dark, he conjured up for these a factitious existence and an imaginary function, and on such a basis reared his theory. The earnest student will not be perplexed by the opposition which ever and anon science receives from those who profess to be her votaries, or by the tardy progress she makes in the mastery of her true domain, when he calls to mind the inveterate obstinacy with which the classmen of the schools adhere to their complicated devices for unveiling the mysteries of nature, when he remembers that the *Principia* was a sealed book to the great body of mathematical scholars for more than two generations; or when he notices in our day, since the theory of the respiratory process has been announced, by which we know that the supply of animal heat is derived from the combustion of carbon in the oxygen inhaled at every breath, that attempts have been made to sustain the doctrine of a "balance in organic nature" by promulgating the idea that plants, as the "recipients of the power of the sun-beam," "transfer this power to the animal;" and that when consumed in the animal, the power so transferred is "expended in building up the organization, in producing locomotion and the incipient action of the heart," &c., and is returned by the animal to "celestial space, whence it emanated."

To such fanciful notions we may oppose the simple teaching of the philosophy which has explained the motion of fluids in plants, and which by a careful induction, may open the path of discovery to us of the efficient cause of the circulation of the blood in animals. At any rate, we may not rest upon any notion of the imprisoned sunbeams, nor, as more generally

taught, of the automatic power of the red corpuscles, of capillary action, of the rhythmical propulsion of arterial currents, nor even upon the contractile movements of the heart, or the nervous force of the brain; for we know that whenever the whole stress of the animal economy is thrown upon either of these, as when the perspiratory function is checked, or respiration impeded, or the waste-valves—if I may so speak of any internal organs—are closed, then their unnatural efforts, soon rendered convulsive, are speedily terminated in death. And I may be permitted to add, that if any mind is led to search after a more extended arena, for the operation of the evaporative force, as if the inquiry were raised whether this is not the display of some universal law in nature, he may find such an investigation quite prepared for him in those matchless tracings of the atmospheric currents, brought to their present perfection by the indefatigable labors of gentlemen connected with our Coast Survey, and the Smithsonian Institution. In the viewless drift of the upper air, far above the sheen and tracery of the clouds, he may discern the surging of the void expanse, whose mighty whirl knows yet a law, and swaying the lower currents by its stately progression, appoints their course, disperses their stagnant columns, and quickens their loitering march. And if he, to whose mind this perpetual unrest of the ærial sea is not wholly a novelty, is disposed to admit the influence it may exert in relieving organic existences, whether vegetable or animal, from the suffocating pressure or deadly taint of vapory masses, or malarious miasms, yet is unable to perceive what further benefit the mobile circulation of the ambient air may confer upon his material interests, or those of the farmers about him, he will learn how the fertilizing gases unspent in the service of vegetable life, whether near the poles or the equator, are wafted in perpetual cycles, concentrated in dews and rain, laying the hill and mountain sides, or precipitated upon arid levels; and in all that garden-belt of America, through which the father of waters urges his mighty floods till they are lost in the hoarse murmurings of the Atlantic surf, unchecked by the Alleghanies, they ride bravely on and greet with their choicest treasures the bosom of his own Empire State.

We have seen how necessary it is, in order to secure the normal healthful state of plants, that attention be paid to the balance between the receptivity of the atmosphere into which they respire, and the vigor they possess of absorbing and assimilating the elements of their nutrition. The wise husbandman postulates for the general purposes of his thrift, that the former is at the regular season of seed time and growth, a constant quantity, and so directs his most careful study to the latter, which he seeks to promote, by neither withholding the supply requisite for full development, nor by furnishing in excess food either inappropriate in kind, or profuse in measure. To know that the different plants we cultivate, require different kinds and quantities of food for their perfect growth, leads at once to the inquiry, what are these various elements of nutrition, and to what soils, for what plants, and in what proportions are they to be applied. Our agricultural chemists have, for the solution of these questions, entered upon

researches more intricate in their details of analysis than any ever before proposed to the physical philosopher, and they deserve, and will, I am confident, receive the lasting gratitude of all thoughtful tillers of the soil. They have revealed to us what elements of plant food are derived from the atmosphere, and what from the soil. It is true the conclusions of fact and theory, as attained by different investigators, are not always the same. The humus theory has been exploded; the nitrogen theory is on the wane, and the mineral theory is fast gaining celebrity. But this indicates only, to the reflective mind, that the veins of inquiry in these several directions have been, or are in their turn soon to be exhausted.

The farmer is not to infer that the humus in his peaty deposits or in the decaying leaves of his forests, or the ammonia yielded in his manure heaps, or supplied in the markets, are to be considered valueless, when compared with phosphatic, siliceous or calcareous applications. Far from it. But he may know, and it would be wisdom for him to know, that by possibility he may have the two former in excess or in disproportion to the other necessary elements of plant food. If the humus theory has been exploded, it is simply because we have discovered that humus is far from being the only supply of carbonaceous material, it having been taught us that the atmosphere yields the greater part of the supply; but it is none the less desirable to acquire the intelligence, that with lime added to it, and, in some cases, silicic acid, the potash, which is the principal mineral ingredient of humus, is liberated for the food of the plant. So with regard to nitrogen, if supplied too largely in ammoniacal form, it is found to be injurious or destructive; yet the discovery has been made that the soil has a power of absorbing it, in almost miraculous proportion, the statement of which, in numbers, I will not draw upon your faith to honor, and leaves us upon the threshold of a problem, as yet insoluble, how best this almost fabulous charm may be broken, by which so many volumes of a gaseous body are absorbed and kept in ward by the merest atoms of soil.

It has been currently believed, by vegetable physiologists, that plants took up their mineral food in solution; but Liebig has almost placed upon this notion the ban of a delusion, by putting forth the doctrine that plants may absorb their food in atomic quantities, without the presence of water. It is believed that researches in this country, by one formerly a pupil of his, may lead to the correction of the views entertained by the illustrious teacher. We learn, from other sources, that the specific gravity of the sap of the vine has been found to exceed, by eight or nine ten-thousandths parts, that of distilled water; also from experiments made in England, that the wheat and pea plants, absorb from every one hundred thousand grains of water, only thirty-two and thirty-nine grains of mineral food respectively. While scientific men differ as to the details of these researches, and have based upon the facts accepted by them, individually, different theories; while the unlearned world have received some of their announcements with hootings of contempt, answered, not unfrequently, by tones far from conciliatory; it is a pleasant reflection for us that, at the present

time, the feelings of antipathy between the scholarly and the practical agriculturists are allayed; that concessions of error have been made on either side, and that the extremes are closing in solid phalanx for the investment of the common objects of their search—*facts*, TRUTH.

And if any shall be encouraged to hope better things in the future of the mastery of their profession, or have resolved themselves to assist in the attainment of this glorious end—to be patient, studious observers of the workings of nature in her several economies of life, or to seek to catch, upon the mirrors which science furnishes, the rays which may illuminate paths yet adumbrated—every object proposed, and every hope cherished in the remarks I have had the honor to submit, will have been attained and gratified.

Gentlemen of the Society, we sustain, in fellowship, important functions to the Institution in whose office and duties we are associated, to our brother farmers, whose labor and measure of prosperity we share, and to the commonwealth whose vast interests so momentarily depend on our assiduity and toil. Our State stands in the very gates of commerce; Science brings her countless treasures, and Art prepares the caskets for their bestowment and use. Earth and sky profusely cast about food for grass, herb and tree, and by unerring laws guard each, yielding seed and fruit “after his kind,” against deluging storms or desolating drought. Truly, our lines are cast upon a goodly land, whose unrivaled excellence transcends our praises; and if, gentlemen, we may now no longer, in our imagination or by the light of science, trace those laws which secure for us so benign a present, and for our offspring so glorious a destiny, let us accept them with a reverent trust; if, for many of us, it is too late to seek to become interpreters of nature, let us, according to our best ability, so teach those who are soon to take our places, her great primal truths—that these, engraft upon their earliest being, may become the germ of other laws to be revealed in the next generation. So much I had hoped to say, in behalf of that College so lately planned for the instruction of our youths in the principles and pursuit of scientific agriculture; so brief a plea you will excuse when you know that this subject will be presented to you specially by the eloquent and erudite President of that Institution.

It is time that I should give place to him who, by your unanimous nomination and choice, succeeds to the first office in your gift. Yet I may be permitted to say to this son of Oneida, whose practical sagacity, abhorrence of pretense, and freedom from guile, have won such a just appreciation from his fellow citizens, in all his former public relations, that his accession to his new post of honor and duty will be greeted with full acclaim by his brother farmers from every section of the State, and that they, with us, hope great things from the moderation and beneficence of his command. It is not my province, and if it were I am not able or worthy, to cast upon his shoulders the mantle of succession, but let him arise and receive it at the hands of a confiding brotherhood.

AGRICULTURAL DISCUSSIONS DURING THE STATE FAIR.

We endeavored to secure a full report of these interesting discussions, but the person engaged for that purpose having failed us, we give the report of the first evening's discussion from the Country Gentleman, and the second and third from the Rural New Yorker, which embody the most important parts of the discussions, and will be read with interest by every practical farmer in the State.

EVENING DISCUSSIONS IN AGRICULTURAL HALL.

CULTURE OF GRASSES.

A large number of farmers met in the lecture room of the State Agricultural Hall, on Tuesday evening, October 4th, and were called to order by T. C. Peters, Esq., of Genesee, after which Judge Blodgett, of Lewis county, took the chair as President of the evening.

Mr. Peters said that it was proposed to bring up the subject of Grasses for discussion, and spoke of the importance of the grass crop to the farmers of New York, and of the reliance placed upon it as a staple crop in all parts of the State. The crop this year, he thought would be far below the average, and in dairy districts he was convinced that three-fourths of the cows could not be wintered, owing to a light crop of grass.

Mr. J. Stanton Gould, of Columbia county, had given the study of grasses considerable attention, and made a lengthy statement in regard to their culture, based upon statistical returns. He thought our meadows produced more ten years ago than at the present day, and attributed their deterioration to the prevailing ignorance, in a great measure, among farmers in regard to the nature, uses, and chemical relative value of the various species of grass. When so much depends upon this, it is surprising that no more careful attention is given to it. Animals he considered but machines for the farmer's use, and by means of which he could turn the products of his meadows and pastures into cash. He stated the annual value of the grass crop in this State to be \$60,000,000; in the New England States \$68,000,000, and in the United States over \$300,000,000. These figures show the value and importance of the crop. It should be the object of all farmers to become fully acquainted with the nature of the various grasses, before laying down their lands. Mr. Gould said that 100 pounds of timothy was equal in nutritive qualities to 300 pounds of the

sweet scented vernal grass, and this latter kind it was which gives the peculiarly beautiful and delicate smell to our hay fields. Some grasses which contain a large amount of carbon and hydrogen, go to make up the fat of an animal; others, composed largely of nitrogen, form muscles; while another variety goes to give warmth to the body in the form of hair. He thought that pure chemistry was not reliable in giving information in regard to the value of grasses, and would suggest to the farmers that the trial be made at their own mangers; first, by weighing an animal when put up to one kind of grass for feed, and also by weighing the hay given, and then changing to other kinds of grasses and noting the result. In seeding down meadows he thought it should be a rule to seed down with a great variety of seeds, as it was well known that large numbers would die, and that only a certain number of seeds would grow in a given area. It had also been demonstrated that only two seeds of blue grass would grow upon a square inch of ground; but by sowing in this space timothy, and also by multiplying the kinds, the whole ground would be filled up, and five or six different varieties grown upon a square inch. He would also recommend to sow such seeds as come into flower at the same time. In regard to the average product per acre, he thought it was greater in the southern than in the northern part of the State.

In regard to the state of land for the grass seed, he thought it would pay extremely well to obtain as fine a tilth as possible, and cover the seed but lightly. One-eighth of an inch was a sufficient depth, while grass seed would fail to germinate if covered to a depth of one inch. The practice of harrowing in grass seed he considered destructive to the crop but if it must be harrowed, it should be done very lightly. If possible, grass seed should be sown just before a rain, and leave that to make the necessary covering. Lime, as an application to land, would be improved in value if slacked in water considerably salt. In conclusion, Mr. Gould referred to draining and irrigation, as the best and most practicable means for the improvement of meadows, and referred to the facts that 6,000 feet of the water of the Rhone, which was carried away in sewers, contained enough value to produce an ox; and that by this means of irrigation the meadows of Edinboro' had been made to produce 25 tons of hay per acre.

Mr. Peters spoke of the lands of Long Island, commonly known as the "barrens," and thought there was no better land on the continent than that in the vicinity of Hempstead. He thought one great advantage of that locality, was owing to the fact of the atmosphere and the heavy dews, as in most seasons of the year the dews are so heavy as to drop from the eaves of the houses.

Ex-President McCoun, from Queens county, was called upon to give a statement of the general system of farming in that county. He stated that they first plowed up a pasture or grass field for a crop of corn, manuring it before it was plowed, with a good coating of stable manure. It was seldom that manure was applied in the hill. Corn would no doubt obtain a quicker growth thus manured, but would not fill out so heavily. After

the corn is harvested the land lies until spring, when it is again plowed and sowed with oats; sometimes, however, potatoes were substituted for oats in this case. When this crop is taken off in the fall it is again plowed for wheat, manure being applied before the operation. The land is rolled both before and after being sowed. Grass seed is sown after the last harrowing. Eight quarts of timothy seed is used per acre, and fields remain in grass for a number of years. Do not pasture meadows in the fall. Sometimes a top dressing of guano, of 150 lbs. per acre, is applied with good results. The soil is a sandy loam. He thought the average of hay to be two tons per acre.

Mr. Marks, of Onondaga county, attributed the light hay crop the present season to the early frosts and the general severe drouth in May.

Mr. Geddes said that more was produced in Onondaga county now than at any former period, and the farmers were employing more skill in the cultivation of their farms. He stated that one-half of the land in the county never had an application of barn-yard manure, but was kept up solely by plaster and clover as a dressing. Their new meadows had produced well while the older ones had not. In sowing wheat he always left the ground as rough as possible, never applying a roller. Six quarts of grass seed, timothy, was used in the fall with wheat, and eight of clover in the spring.

Mr. Lyon, of Lewis county, thought the best time to cut timothy was when it was in the second blossom, before the seed had matured. Clover he would have cured in the cock, and cut when the dew was falling at night, at a period before the blossoms get dry, and when two-thirds of the flowers are ripe.

Mr. Marks thought the deterioration of our meadows was caused more by late mowing, and then having dry hot weather in the fall, before the roots have time to get strengthened. If possible he would have all his hay cut and harvested from the 5th to the 20th of July. Canada thistles, if allowed to go to seed, he was satisfied would die out in five years.

Col. Brewer, of Tompkins county, considered 75 lbs. of hay, cut green, worth more than 100 lbs. cut when ripe. At all events, grass should be cut before it has dropped its seed. He thought a ton of hay, cut when dead ripe, would not form a single pound of new flesh. Clover he had cured well by putting it in the mow with layers of straw, and considered it the very best hay for horses, sheep and milch cows. He had grown wheat on the same land seven years out of fourteen; Tompkins county is fourteen hundred feet above tide water; he used one peck of clover seed per acre, put on the land about the first of April; he had renovated an old meadow by early cutting, not pasturing it in the fall.

One speaker stated that he had proved that timothy, if cut below the first joint, would die out.

It was considered that clover seed would do well if sown in the fall, if the winter was one in which a large body of snow laid upon the ground, and no frost occurred.

WEDNESDAY EVENING, Oct. 5th.

At the suggestion of Hon. T. C. Peters, of Darien, Col. Zadock Pratt, of Greene county, was called to the chair. Mr. Peters announced the subject proposed for discussion as "Manures, and the best modes of applying them," and remarked that this was a very important question, for many farmers had learned that they could not grow crops without manures, and others were fast learning this important lesson, whereupon,

Wm. Plumb, of Onondaga, spoke of his system. He used from twenty to twenty-five loads to the acre. Apply it generally in the spring, and plow under as soon as practicable. Takes long, dripping manure from the barn-yard, spreads it on the land, plows under, and plants corn—next year barley, and next wheat. Then lays down to clover. The President inquired if Mr. P. could live by such a system if he employed a man to do the work. To which he replied that he commenced with nothing, had paid for his farm, and had a little money left to expend in attending the State fair.

Mr. Winegar, of Cayuga, thought manure should be plowed under, as a general rule, but had found a top dressing excellent for wheat.

Mr. Mosely, of Onondaga, had learned much about manures and their management from John Johnston, of Geneva, and had, in the main, adopted his mode. Stabled his stock, and made the most of the manure. Drew it to the fields in the winter directly from the stable, and threw it on the snow. In this way did not have to draw as much water as though it had lain soaking until spring—drawing does not cut up the land, and the work is done at a leisure time. As soon as the ground was ready, plows it in lightly. In this way he had subdued heavy clay knolls, and made them as mellow as an ash heap.

Mr. Peters said he differed with some gentlemen in regard to the application of manure. He would not plow in manure deep. Bury it ten inches or so and the roots of the plants would have difficulty in finding it. The second time of plowing he would plow deep, so as to sandwich the manure between the two plowings. Nature applied her manure on the surface, and she had made a wise provision for an annual manuring. His experience was that manure placed on or near the surface, produced the most satisfactory results.

Lewis F. Allen, of Black Rock, said any general rule for the application of manure will prove a fallacy. One system will not do for all soils. Clay soil retains manure as it does water, and it remains dormant unless it can come near the surface. His farm was mostly in grass, and he applied manure in September and October, on the surface. Its effect on the growing grass can be seen for half a mile. If manure is applied in the spring it is lifted up by the growing grass, clogs the machine, and its full benefit is not gained until the following year. A good way of manuring is to put sheep on the grass in the fall, and allow them to eat down to the roots. Had one meadow, giving fine crops, that had never been plowed since the creation, and of course it had received no other than surface manuring.

Mr. Lyons, of Lewis county, had cultivated what was called a hungry

or leachy soil. Plowed manure in just as it came from the barn, and deep. That which did not decompose the first year was not lost, it was available after the next plowing. He did not believe in the leaching of manures. Manure water poured on a barrel of sand would leach through pure water. He did not, either, believe in late fall pasturing, as recommended by Mr. Allen.

Mr. Winegar, in reply to the remarks of Mr. Peters, that nature had placed manure on the surface, said that nature did no plowing. The greatest difficulty with him was to get the manure under. Had no fears of getting it too deep.

A. Goldsmith, of Orange county, said inorganic manures may be spread on the surface without loss, in fact they would be likely to gain ammonia from the atmosphere.

Mr. Collins, of Lewis county, had a piece of land which had been in grass over fifty years. It now produced over three tons to the acre. Of course it was never manured, except on the surface. The effect of surface manuring on this grass could be seen for five years.

Mr. Marks, of Onondaga, was first taught that manure should be plowed in, but often saw no good effects from the manure he used. Now he composted in the yard, and drew to the fields in September or October, and applied on the surface. Some years ago he had resolved never to plow under manure again, but last spring deviated from that purpose, and well plowed under twenty cords per acre, and planted corn; the crop is not much better than where no manure was used. He would never bury manure again, as he invariably got the best results from surface manuring.

Mr. Sylvester, of Lyons, always plowed under manure. Was so particular to have it covered, that if he drew manure to his fields in the winter, he covered the piles with swamp muck. Obtained a field that was so poor it did not produce six bushels of corn to the acre the year before, manured it heavy with stable manure, plowed it under deep, and the first year got eighty bushels shelled corn to the acre. The soil is a clay loam, north of the village of Lyons.

Mr. Geddes, of Onondaga, said such experiments as that stated by Mr. Sylvester were apt to lead to error. It was complicated. Mr. S. had plowed deep, broken up the subsoil, which perhaps had not been done before, and this, in addition to the manure, gave a good crop. He was indebted to Mr. Marks, of his county, who taught him, by example, to put manure on the surface; but John Johnston was the first man who had the boldness to recommend such a course in print. The object to be sought in manuring is to make the grass grow; this fills the earth with roots, which rot and greatly enrich the soil. Mr. G. found manure to pay better upon grass and wheat than upon any other crops. Apply manure upon wheat, as a top dressing, in the fall or early in the winter, and it will remain green as a meadow through the winter; even upon knolls where the snow was blown off. Had called the attention of Mr. Peters to this, and he

expressed fears that it would not stand through, but his fears were groundless. In answer to the inquiry whether drilling had not been the cause of the thrift of his wheat, Mr. G. said that all his wheat was drilled, and only a part top dressed, and this part showed the vigor, through the winter, of which he spoke. Mr. G. inquired of farmers present, whether they had ever derived any benefit from the use of plaster before the clover came up. He wished them to give a little attention to this subject, as his experience was that plaster required the leaf to operate upon.

Mr. Chester, of Ulster, had found manure applied in all ways beneficial; the question, and a very important one, which was the best way to apply it. Mr. C. generally plowed six or seven inches deep, and then harrowed. Farm, a sandy loam; brought manure from the city. Always used composted manure; had tried coarse manure and found it far less profitable than that which was composted. A little compost in the hill would produce better results than a large dressing plowed or dragged in. Last year plowed in manure, and did not receive five per cent of the benefit he would had it been used in the hill. Never let land lie in grass for a series of years; could not be satisfied with a small crop; broke it up, manured, and made it produce abundantly.

L. F. Allen said grazing land in Kentucky, that was never plowed, was worth from \$100 to \$170 per acre, and would keep a bullock to the acre. The cattle were fed upon it, and that was all the manure the land got. From these lands came the fine Kentucky cattle to the New York market. Some time since Mr. A. spent a day at Mr. Patterson's farm in Maryland. When he came in possession of it, it was poor, worn out land, not worth five dollars an acre. Mr. P. bought limestone land, made lime, and scattered it over his poor soil, until it looked as though it had been visited by a snow storm. No manure was applied but lime and plaster, and now this land produced two and a half tons of hay to the acre.

A. L. Fish, of Herkimer, owned a farm 800 feet above the Mohawk, on the south side. When he came in possession of it, it was very poor, could not make grass grow. The hard problem with him was, how to commence to improve. He plowed, planted to corn, and manured in the hill with artificial manure. Fed the corn and stalks to cows, carefully saved all the manure, and drew it out in the winter. Manure should be thoroughly mixed with the soil. Manure itself will not grow plants, nor will poor soil; but when both are well mixed together, healthy plants and a good crop may be expected. He plowed deep, and then sowed clover, which succeeded, and the difficulty was then overcome. Now the product of his farm was four times what it was twenty years ago. Then, twenty-five head of cattle was all the farm would support; now, he kept sixty, and all done with manure produced upon the farm, with the exception of a little guano, at first, to get a start.

Mr. Bartlett, of Dutchess, made a good deal of manure by stabling his cattle. Would recommend to farmers a course which he had pursued with advantage. Wherever he noticed a poor knoll, or a poor spot anywhere on

his farm, as shown by the crop, he put stakes to mark it, and at the proper time applied manure liberally to these places, just as he would notice and nurse a weak lamb in the flock.

A. Goldsmith, of Orange, said all farmers know that land *can* be kept in grass a long time; but the great majority, he thought, considered it a very unprofitable practice. Gentlemen said that after top-dressing from year to year, fine grass was produced. Then he advised that it be plowed under, so as to enrich the soil. Was astonished to hear any one say that manure could be applied to wheat and grass more profitably than to any other crops. Corn would grow in a manure heap, and no crop was more benefited by manuring.

James Willis, of Queens, said his method of manuring corn was to draw out the manure in the fall, and plow it under in the spring.

Solon Robinson wished those present who were giving advice, to remember that the most difficult thing was to commence improving poor land. After a good commencement, progress was easy enough. He had some very poor land; couldn't afford to buy guano, or other manures, to enrich it; had no stock, and what could he do?

Mr. Fish recommended the planting of corn, and the use of ashes and nightsoil in the hill.

Zadock Pratt said in the Catskills they placed the tanbark, and the fallen leaves from the woods, in the barnyard. This soon made manure, and was placed upon corn land. This was the way the farmers of Catskill mountain region commenced to enrich their land.

Mr. Peters thought he might aid Mr. Robinson in his efforts to make the "desert blossom as the rose," by giving a brief statement of a case of improvement in Genesee county. There was a streak of poor land lying south of his residence, so very poor that it would not grow grass. A number of years since a German bought three acres of this land. He sunk an old barrel, and into it was emptied all the slops from the house. When it became *strong* it was placed over a small piece of land, and the barrel was refilled. In this way about a quarter of an acre was enriched and planted with cabbage plants, and these, as they grew, were refreshed and fed by the contents of the barrel. The result was a very great crop of cabbage. These were fed to a cow, all the stock the owner kept, and the manure applied to the soil. The next year more than half an acre was enriched. That three acre farm had grown into fifty acres of as good land as there was in Genesee county.

A. B. Conger, President of the State Agricultural Society, said he regretted that the discussion had not been a little more philosophical. There was some good in all that had been said, but there were principles well settled in agricultural philosophy which might account for the different experiences of the speakers. It had been settled in England, that nitrogenous manures were the best for grasses, and phosphatic manures for leguminous plants. Fermenting manures had been talked about. Fermentation was the process of decomposition; it was another word for

dissipation. Unless something is done to arrest it, it would destroy the manure. On the best mode of applying, there was but one rule. The manure was for the benefit of the roots, and should be placed where it can be within their reach. Mr. C. said his object in rising was not to talk himself, but to introduce a farmer from Massachusetts, the Hon. Josiah Quincy, Jr., who had had great success in soiling, and could impart valuable information on that subject.

Mr. Quincy said he would make but a simple statement of his practice. Owned a farm that, twenty years ago, produced only twenty tons of hay ; now it gave him, every year, three hundred. This improvement was effected by the introduction of the English system of *soiling*. The saving of fencing, by this system, would be immense. On one hundred acres he had not an interior fence. Farmers do not appreciate the value of cow manure. Most of his information was derived from Mr. Dana, a chemist, and author of the *Muck Manual*. He was chemist to the manufacturers of Lowell, and cow manure was the only thing known that would *set colors*, until Mr. Dana, by studying the composition of cow manure, discovered the principle in the manure so necessary to the manufacturers, and taught them how it could be obtained in a better and cheaper way. A cow will produce about $3\frac{1}{2}$ cords of solid manure in a year, and the liquid manure is equal to about 3 cords of the solid. If dry muck was used in the stables, this quantity would be increased threefold, making it about 20 cords a year to each cow. Such manure, within five or eight miles of Boston, was worth from \$5 to \$8 per cord. From these figures, he had come to the conclusion that the manure of a cow was as valuable as her milk ; but, for fear he was over-estimating its value, he submitted the question to Mr. Dana, who had given, perhaps, more time and study to this subject than any other man, and Mr. D. pronounced his estimate correct. On this authority, therefore, he would state that the manure of a cow was as valuable as her milk. The farmers of this country have not yet learned how much can be done on a little land. The laws of France divide the farms among the children, and it is estimated that there are in that country 250,000 farms, less than five acres each. The farmers of this country should divide their farms with their sons, instead of sending them West, and grow a large amount of produce on a small breadth of land, and great good would result to both old and young.

THURSDAY EVENING, Oct. 6th.

The discussion on Thursday evening was fully as interesting as that of the preceding, and every seat in the Society's large Lecture Hall was occupied. At the suggestion of Hon. T. C. Peters, Dr. Crispell, of Ulster county, was called to the chair. The discussion on *Manures, and the Best Modes of Applying Them*, was resumed, though *Soiling*, as on the previous evening, occupied a large share of attention.

Mr. Leland, of Saratoga, wished, as much had been said about spreading manure, and its evaporation, to know the experience of farmers in

spreading manure in the winter, when the evaporating season is over. Mr. L. thought in the weather in the fall, winter and spring, the manure gained more from the atmosphere than it lost. There was a great difference in soils, which must be taken into consideration in applying manures. Where Mr. L. lived plaster did no good.

Judge Blodgett, of Lewis, thought the most important question in the treatment of land had been overlooked,—that was its *preparation* for manure and for a crop. It should be well broken up, made deep and friable, and then the full benefit of any manure applied was received. The Judge found it difficult to reinstate a good pasture after the land had been disturbed and robbed of its virgin fertility. Avoided disturbing pasture as much as possible, but when it became necessary, did the work thorough; underdrained, cultivated and enriched the soil, and in this way a good pasture was again secured. His treatment of meadows was different—plowed deep, and incorporated the manure with the soil, as far down as pulverized. Sowed but little grass seed, for if the soil was natural to grass, it would soon become as thick as necessary or profitable. After a meadow was started right—with a rich, well-prepared soil—top dressing might answer, but top dressing would not be of much benefit to a poor, badly prepared meadow. Manure is of much more benefit on good land than poor. Manure that, when applied to a meadow giving *two* tons of hay to the acre, would increase it to *three* tons, would hardly be perceived if put on a meadow giving one ton or less to the acre.

L. F. Allen said that in England land had remained in pasture ever since the conquest. In Massachusetts land had lain in pasture for more than one hundred and fifty years. The *Southern Tier* is the finest dairy region in this State, and there pastures are never disturbed, but remain with their cradle knolls, and any man would be thought a fool who disturbed them. On the surface there is a thin coating of decayed leaves and buds, and branches, just right for the roots of the grass, but turn this under, and the soil that comes in contact with the roots is uncongenial.

At this stage of the meeting Mr. Peters introduced Hon. Josiah Quincy, Jr., of Massachusetts, of whom many present wished more particular information in regard to his system of soiling, of which he gave some account at the last meeting.

Mr. Quincy said that had he known what would have befallen him, he hardly thought he would have ventured into the room last evening. For, he had stated about ten o'clock last night that the manure of a cow was worth as much as her milk, and gave his reasons for thinking so, the figures on which the estimate was founded, and the endorsement of the celebrated chemist, Dana. That morning, about 10 o'clock, on taking up a New York paper, he was surprised to read a paragraph saying "Mr. Quincy stated at the meeting of farmers last evening, that cow manure was as valuable as milk." This, without any explanation, he feared his friends at home would take as pretty good evidence that he needed looking after. Mr. Q. said he would endeavor to answer the questions that had been asked him, and would give all other information in his power.

What is the best material for soiling? Grass, oats, corn and barley were all used. Begun with grass, and continued its use, until about the 1st of July. About the 5th of April sowed oats, four bushels to the acre, and made another the 20th of April, and another the 1st of May. The oats furnished food during the months of July and August. After the 1st of May planted Southern corn in drills, and again the 1st and 20th of June. This supplied food after the oats were gone, during the months of September and October. Next sowed barley, making several sowings, about ten days apart, until the 1st of August, and that gave plenty of food until time to dig the roots, when the tops were fed. English writers thought that seven cows could be kept by the soiling system for one by the old plan. With Mr. Q. an acre would keep three or four cows, the difference depending upon the manuring. It is almost impossible for us to realize the value ascribed to manures in England. Mr. Meechi, at *Tip-tree*, used all his manures in a liquid state, forced through iron pipes by an engine. The crops produced by this system seemed incredibly large. At the *Willow Bank Dairy*, manure is applied liquid by carts and casks. The crop is cut green for soiling, and then the land is deluged with manure water. The result is four or five crops in a season, seeming almost fabulous in amount. The farmer must rely on home-made manures, and the making manure must be a main feature in all good farming. Our artificial manures were greatly adulterated. Farmers thought that *milk* was the only article that could not be adulterated. Muck was of great value in saving manure and in increasing the manure heap. By composting with muck the amount may be trebled. Mr. Q. read a letter from Mr. Dana, endorsing the statement he had made the previous evening, that the manure of a cow was worth as much as her milk. In his own stables, made a trench 4 inches deep, and 18 wide, water-tight, at the back of the stables, and over the barn cellar. Filled these trenches with muck, to save the liquid manure. In England, similar trenches were sometimes filled with water. Into these all the manure was swept, when it was allowed to run into a reservoir, and the trenches were again filled.

In answer to a question in regard to the health of his stock, Mr. Q. said he had not had a sick animal in a long time. They appeared quite comfortable. Let them out in a yard for an hour or so, morning and afternoon, but they generally appeared glad to return to their quarters. The cow don't need much exercise. In the pasture, when feed is plenty, they eat what they need, and then lie down carefully and comfortably and chew the cud. Just in the best season pasturing may be as well, and perhaps give a little more milk, but this only lasts for a few days—just in the flush of grass. Mr. Q. was much in favor of soiling, liked it; made it easy to keep a large amount of stock on a small farm—thus increasing the fertility of the land, and the number of farms and farmers. The farmers were the conservative element in this country. When we read of the *Dead Rabbits* in New York, and the riots in Baltimore, we were apt to have some misgivings as to the stability of our institutions, forgetting this conservative

element. The ocean is of the same temperature at all seasons, and modifies that of continents. So the farmers, with the love of home and country—virtuous and patriotic principles—strongly implanted in their breasts, will modify these destructive elements, and preserve all that is right and true in our institutions. He once asked the elder Adams when he first became convinced that the colonies would sever their connection with the mother country—if it was at the first outbreak at Lexington or Boston—and he replied that he first became convinced of this fact when he taught school at Worcester and learned the sentiments of the farmers. In answer to further inquiry, Mr. Q. said, in a well arranged stable it was very little trouble to take care of stock in this manner.

Bartholomew Gedney, of Westchester, drew out manure in the spring, with all the juices; then plowed under, for corn. Saves all the liquid manure from the cows. It runs into a cistern prepared for the purpose, and is pumped up with a chain pump. The result was entirely satisfactory.

Mr. Stewart, of Erie, had practised *soiling* for three years. One acre, with this system, is equal to four tilled in the old way. The extra manure pays for all extra labor, and the saving in fences is no small item. Adopting this system would double the proceeds of any man's farm. *Steaming food* he had also found of great advantage. Straw, cut, steamed, and mixed with a little meal, he found better than the best Timothy hay. One man can take care of more than fifty cows; had kept that number, and it did occupy all a man's time. Considered that steaming and soiling was worth not more to him this year than \$500. Raised a good many carrots, and fed these until about the 20th May, or until clover was ready to cut. Fed with this until corn was large enough to cut. Corn comes the nearest to fresh grass in the manufacture of butter. In winter fed roots largely, with about three bushels of cut and steamed straw to a cow, and a pint of meal to each bushel of straw. The roots were steamed with the straw.

George Clarke, of Otsego, was willing to learn, but he wished to learn from those who knew more than himself of farming, and not from those who live in cities, and ride out in their carriages, two or three times a week, to see what Patrick is doing, and to furnish the money for him to work with. Was opposed to this high farming; it would grow so large crops, and make produce so plenty, as to bring down prices and ruin farmers. In fact, should all go into this system, there wouldn't be mouths enough in the world to consume the produce. Some years ago, growing hops was very profitable in Otsego county. Rather small crops were raised, which sold at a high price, and those engaged in the business made money. But others went into raising hops, exercised a good deal of skill at the business, grew large crops, and for the last seven years hops have been a drug, and all have lost money. So it would be with grain, cheese, butter, &c., if we all go in for raising large crops. It is better to keep on in the old way, only improving gradually, as fast as there was a demand for more produce. This speech caused a good deal of merriment.

Mr. Darling, of Cincinnati, wished to endorse what had been said about

steaming food for stock. He had found it of great advantage, particularly to corn stalks, which cattle would eat up clean, when cut, steamed, and mixed with meal.

Mr. Gedney, of Westchester, thought one acre of corn, used in soiling, worth as much as ten acres of good rowan pasture.

Geo. Geddes, of Onondaga county, asked no man to adopt his mode. Don't attach so much importance to manure as the farmers of the vicinity of the Hudson river. Yet followed a system which increased the productiveness of the soil, and that was the true rule upon which all farmers should act.

Mr. Goldsmith, of Orange county, said it was the practice of many farmers to sow corn to feed when pastures grew short, which practice they found profitable; and so they did to feed meal largely.

Mr. Curtis, of Tompkins, wanted to know if farmers could afford to haul manure half a mile, when they can buy clover seed at five dollars a bushel, and plaster for ten or twelve cents a bushel. Clover seed was the cheapest manure that he could use.

Mr. Day, of Genesee county, was in favor of manuring with clover, when he can make it grow, but finds great difficulty in getting the seed to germinate, and then he is obliged to haul manure, no matter how far, because if he neglects to manure his land, he gets no profitable returns.

At nine o'clock, a motion was made to adjourn, but was voted down, with a strong manifestation to hold on, and gather all the information possible.

Solon Robinson, being called for, said that he had no desire to occupy the time. He wanted practical farmers not to be afraid to speak; and he urged all present, who felt the importance of these Farmers' Club meetings, to organize them in their own neighborhoods, and try to learn facts from each other's experience, and, above all, to try to learn what are facts.

Mr. Geddes said, that although he did not think the mass of farmers of this State, were prepared to adopt the system of soiling recommended by the Hon. Josiah Quincy, Jr., yet he moved a vote of thanks to Mr. Q., for his interesting and valuable remarks. The vote was unanimously passed.

Several other persons spoke, and at ten o'clock the meeting adjourned, every one apparently fully pleased; and thus ended the discussions.

DISCUSSIONS AT THE ANNUAL MEETING.

According to the programme adopted by the officers of the Society, the second day was devoted, mainly, to discussions, and at ten o'clock a goodly number of farmers assembled in the Agricultural Hall. Chancellor McCoun took the chair, and made some appropriate remarks.

POTATOES, AND THEIR CULTURE.

J. Stanton Gould wished information on a very interesting and important subject, and as there was at least one gentleman present who, from long experience, had fitted himself to impart this information, he called upon Hon. A. B. Dickinson, for his views upon *Potatoes and their culture*.

Mr. Dickinson was very ready to impart any information he possessed. Had learned enough from Dr. Fitch, about destroying the weevil, to pay his whole salary. Now, he asked no favor of the weevil, and showed no quarter. In answer to the question how he conquered the midge, Mr. D. said, by late fall plowing, and sowing spring wheat. (Rather a doubtful victory this, in which the victor has been compelled to abandon the culture of winter wheat!) There was one kind of soil, where, when new, the potato would not rot—that natural to the red raspberry. Had learned much from observation. Nature is a good teacher, and it is well to observe the wild plants. Mr. D.'s mode of culture was to make the furrows so as to be certain to draw the water, but to draw it as slow as possible. Made the rows in the way the water runs. Plow and subsoil eighteen inches deep. Planted in double rows, one set in a place, fourteen inches apart, and cover with the plow, roll and drag. Drag, if weedy, even after the potatoes are up, and plow between the rows. If grass comes up, let in the sheep. When the potatoes begin to set, run the subsoil plow between the rows, and even under the potatoes, so that people think they are killed; but it don't hurt them. The largest crop he had grown, was 425 bushels to the acre.

In answer to several questions from gentlemen present, Mr. Dickinson said he allowed two eyes to a set, and they were planted zig-zag in rows, fourteen inches apart. Before planting, the sets were wet with tar-water, made by dissolving a pint of tar in six or seven pails of water, and they are then rolled in plaster. The heaviest potato is best to withstand the rot, but it is difficult to find a heavy potato fit to eat. Tested their weight by brine. The best soil is a clay, cool and moist, but not wet. Fresh manure had a tendency to rot potatoes.

THE AGRICULTURAL COLLEGE FARM.

Here, Mr. Dickinson, while entertaining a great respect for the trustees of the Agricultural College, criticised some of their sayings and doings. They had a clod-crusher—an implement that should have no place on a farm, and he recommended the trustees to bury it.* The ground should be plowed so that there would be no need of a clod-crusher; shaved up thin, and then it would be light and mellow, and a foot higher than where clods were turned over. Even the roller was a dangerous implement on heavy land. The death of forest trees on the farm, was attributed by the trustees to the removal of the underbrush, which they stated had shaded the land and preserved the moisture.

T. C. Peters.—What caused the death of so many of the trees?

Mr. Dickinson.—They had lived out their time, exhausted the soil of the elements necessary for their growth, and, in the order of nature, must give way to another variety of timber.

ARE THE CROPS IN NEW YORK DECREASING?

P. M. Wetmore wished to inquire of the gentleman on the floor, and any others who could satisfactorily answer the question, whether the crops in the State of New York were decreasing. It had been so stated, publicly and confidently, and he had seen no facts to contradict the statement. Such statements were injurious, driving purchasers of land from this to the western and other States, and lessening the value of lands here.

A. B. Dickinson.—There is no truth in the statement. Farmers now raise more than their fathers did; live better, dress better, travel more, live in better houses, educate their children better, and are, in every way, more prosperous.

P. M. Wetmore.—Mr. Pell says our crops are decreasing, and quotes the State census as authority. How are we to meet these figures? The Agricultural Society should take pains to gather facts and figures on this point.

Mr. Dickinson.—Mr. Pell has said a great many strange things. He delivered an address before the American Institute, in which he stated he

* *Clod Crusher*.—We give the following account of a western farmer, as to the value of the corrugated field roller, as used on wheat fields, of the kind presented to the Agricultural College farm:

"The corrugated field roller performs such multifarious duties, and 'meets the case so well,' where all other remedies have wholly or partially failed, that we doubt not that at some future day, it will be pronounced one of the best agricultural inventions of the age.

"It crushes the clods, pulverizes the soil, and presses it to the seed in the best possible manner; by the joints in the frame, it adapts itself to the undulations of the surface, and gives a uniform pressure; it can be loaded with any desired weight, without pressure on the necks of the team; the indentations, or small furrows made in the soil, furnish an excellent diffusive surface drainage, taking off the surplus water in winter, in minute streams, without washing the soil; and lastly, the ridges, at short intervals, afford protection in the winter and natural cultivation in the spring. It may be used with equal advantage on drilled and broad-cast seeding. In using after the drill, a ridge of the roller runs upon each row of seed. It has been demonstrated by two experiments in this country, that wheat may be made to yield over one hundred bushels per acre. It is not expected that the most of the farmers will attain such results; but the same principles of general application, as indicated above, with proper drainage, deep plowing, and the use of lime and salt on the seed, may easily return a yield of forty or fifty bushels to the acre. Such is, occasionally, the result now, where there is a good stand in the spring."

could put something in the water given animals to drink which would cause them to fatten in six weeks. He also recommended digging drains eight feet deep.

Mr. Geddes, of Onondaga, in the past year had traveled over the county where he lived, and entered almost every man's house. The wheat crop last year averaged thirty-five bushels to the acre, and yet is the most unprofitable and the most uncertain crop raised. Corn is much more certain and more profitable. The census returns are unreliable; often carelessly taken, and the estimates guessed at by those who give the information. Few farmers know how much they raise on an acre; they do not even know the size of their fields—all is guess work. The census is made once in five years. The last census was taken in 1855, and gave the report of the unfortunate season of 1854. The next census will give us the very favorable year of 1859; but this, like 1854, was merely accidental. Mr. G. knew Onondaga when but little of its soil was under cultivation, with here and there a log house. Now the soil was nearly all under good cultivation, well fenced, with excellent barns for grain and stock, and good houses for the farmer and his family. The farmers of Onondaga were independent, living in good houses, educating their families, and possessed of all the necessities and many of the luxuries of life.

T. C. Peters had occasion to go over the State the past season. The universal answer to the question, was, "We are improving in our agriculture. We are raising more food than ever before." These men that generalize on our statistics do not understand the changes in our agriculture. Corn has quadrupled in the last twenty years. On account of the facilities afforded by railroads, the West can send wheat to our leading markets cheaper than we can, while we find other crops more remunerative.

Mr. Wetmore was a very small farmer, and had been a merchant all his life. It is the duty of farmers to aid their profession. Mr. Pell had said, among other things, that the potato crop had largely decreased. These statements go uncontradicted. No class of merchants, or mechanics, would allow such statements, injurious to their profession, to go forth uncontradicted, even for a month. Mr. W. thought the census should be taken every year.

The discussions were further continued, and the testimony of farmers present was, that our farming is improving in accordance with the statements of Messrs. Dickinson, Geddes and Peters.

REPORT OF COMMITTEE ON FARMS,

ENTERED FOR PREMIUMS, 1859.

ANNUAL MEETING, *February*, 1860.

Farms.—The committee appointed to examine the farm of Lewis Sherrill, of Greene county, attended to the duty assigned them. They were pleased to find Mr. Sherrill's farm in a fine condition as to its arrangements, crops, stock, &c. He is pursuing a judicious course in drainage; his rotation of crops appears to be judicious, and the returns from his farm, which will be found in his report annexed, satisfactory, taking into consideration the season and state of the markets. In Transactions for 1858, page 170, 171, will be found a description of the buildings on this farm, and the fences and gates. Mr. Sherrill's return last year was not as full as required by our regulations. He has corrected this in the annexed report.

In the examination of this farm we find manifest improvements, all done under the direction of Mr. Sherrill, showing the advance he has made from its first occupancy, many years since, up to the present time.

We think Mr. Sherrill, taking into consideration all the circumstances connected with his management and improvements on this farm, justifies us in recommending the award of the first premium.

WILLIAM KELLY,
B. P. JOHNSON,

Committee.

LEWIS SHERRILL'S GRAIN FARM — GREENVILLE, GREENE Co.

First Premium, \$50.

The following answers to the questions proposed by the New York State Agricultural Society, will give a fair statement of the manner in which my farm is managed.

1. Farm situate in the town of Greenville, Greene county, and contains 170 acres.
2. The soil, clay loam, intermixed with gravel; subsoil, clay; no limestone rocks; some granite and some slate.
3. Land improved by judicious plowing, manuring and seeding; keeping in view a good rotation of crops.
4. Plow from six to eight inches deep; deep plowing acts as a regulator of the soil.

5. Have not made experiments to test the difference in crops, between deep and shallow plowing.

6. I have not used the subsoil plow; but have drained with stone, which are convenient upon the farm, and find the results very satisfactory.

7. Trees, common to the farm, are beech, maple, hemlock, some ash, elm, &c. Plants, the usual wild ones, raspberry and strawberry.

MANURES.

8. Usually apply about 40 loads of manure per acre; draw out the manure from the stable in winter and spring, to the field where corn is to be planted, and the remainder is composted for fall use; part of it is kept under cover; has no cellar to the barn.

MEANS FOR MAKING MANURE.

9. The barnyard and a muck swamp. We manage our manure according to circumstances; sometimes draw muck in the yard, but more generally draw the manure to the field to be composted. Make about 300 loads, and all made is applied.

10. In a green or compost state—the green manure is preferred for corn, the compost for grass and winter grain. On this farm, this course is most profitable.

11. Have not kept as full accounts, perhaps, as would be desirable; I feel the importance of giving attention to it.

12. Lime has not been used; plaster is used profitably on corn and newly seeded land. Guano, salt and superphosphates, have been used only to a limited extent, and have not any facts resulting from their use, which would be of importance to others.

TILLAGE CROPS.

13. Usually till about fifty acres: 16 to corn and potatoes, 16 to oats and wheat, then rye, and seed to grass; amount per acre, usually, corn, 40 bushels, oats 50, wheat 20, rye 15.

14. Use five quarts seed for corn; oats, two and a half bushels; wheat, one and a half, rye, one and a quarter. Plant corn from 15th of May to 1st of June. Sow oats and wheat as early in April as the ground can be prepared; rye, early in September.

Wheat has been injured by the midge, and have found no remedy for its ravages. Have never made any experiment to ascertain the loss to the soil from the culture of a bushel of wheat.

15. In corn, green manure, plowed under, is preferred, as before stated; and the winter grain and grass compost in the fall.

16. Corn covered deep, other grains harrow in.

17. Potatoes have been diseased to some extent, but no remedy for the disease has been found.

GRASS LANDS, &c.

18. The kind of seed sown is clover and timothy; ten quarts per acre, in equal quantities, sown in the spring. The natural grasses which come in spontaneously, are the best grasses for dairy purposes.

19. Mow usually about forty acres, have an average yield of two tons per acre ; cut the grass when in bloom, put in cock until fit for the mow.

20. Meadows are prepared by careful plowing and seeding.

21. Irrigation has not been practiced ; and, 22, muck land has not been reclaimed for culture.

23. The Canada thistle, one of the most troublesome pests, has not been entirely subdued ; but a warfare is continued, hoping for a final triumph.

DOMESTIC ANIMALS.

24. Eight oxen, 11 cows ; 46 young cattle—mixture of Devons and Durhams. Six oxen are being fed for market. Five horses.

25. Have not made experiments to test the comparative merits of different breeds of cattle.

26. The best manner of wintering cattle depends upon various circumstances. Straw and grain are often cheaper than hay, and they are then used. I prefer feeding in the stable as a general thing, rather than the yard. Cattle are fastened with stanchions ; spring water is at hand under the sheds in the yard, at all seasons.

27. From 11 cows we made 1,100 lbs. of butter, and 600 lbs. of cheese. The cows are mostly young ; the older ones are yearly disposed of. The method of making butter is not different from that practiced in the best dairy districts.

28 and 29—relating to sheep. As sheep are not kept on this farm, to any extent, I am not prepared to give any statement as to their management or the relative value of different breeds.

30. The swine kept on the farm are the common swine of the country, crossed, doubtless, with improved breeds. Feed on corn in winter, milk and ground feed in summer. Pigs, at six months old, average 150 lbs. dressed ; and old hogs, 400 lbs.

31. Have not made experiments as to the relative value of root crops for feeding, as compared with corn ; but am highly in favor of Indian corn for feed.

FRUIT.

32 to 36. The questions as to fruit will be answered together. Have about 200 apple trees in bearing, grafted with the best market fruits—pippins, greenings, &c. ; plums, cherries, peaches and pears ungrafted ; and the curculio, with the black knots or warts, have proved nearly fatal to the plum ; use the knife freely on the black knots.

My fruit trees are carefully pruned, and manured with muck which keeps them in a healthy growing condition.

FENCES, BUILDINGS, &c.

37, 38 to 42. Barn three stories high, capable of holding seventy-five tons of hay ; 1000 to 1500 bushels of grain ; stables for twenty-two head of cattle besides stalls in sheds connected with the barn ; a straw barn is also connected by a platform with the main barn, and all the straw is

deposited from the upper story as it comes from the thrashing machine in this straw barn. The barn is so arranged on a side hill, that entrance can be had with teams into the second and third stories, and has been so arranged as to require as little labor as practicable; connected with the barn are the cribs for corn, with power to shell the same, all under the same roof.

Fences.—About 2500 rods of stone fence, cost about \$1.25 per rod; clearing off the land and at the same time securing a durable and valuable fence; gates are hung upon stone posts, and are little liable to be out of order. The grain upon the farm is all measured when thrashed, and a general estimate of the whole income and value of the year's work can be ascertained. I am of the opinion that a still more minute account of all the proceedings on the farm is desirable, and would prove both a pleasure as well as profit. The marketing of the produce from the farm is about 10 cents per 100 pounds.

The receipts, &c., of the farm for the year, \$1,660; expenditures, \$650.

Amount received for cattle sold,	\$675
do sheep and swine sold,	95
do hay sold,	350
do grain and other produce	340
do butter and cheese,	200
	<hr/>
	\$1,660
Brought up,	650
	<hr/>
	\$1,010
	<hr/>
Cost of building tool house,	\$50
Cost of manure purchased,	40
Paid for labor,	300
Board of laborers,	150
Blacksmith's bill,	30
Repairs, wagon, &c.,	20
Cost of implements and seeds,	55
	<hr/>
	\$650
	<hr/>

General Farm Accounts.

Jan., 1859.

Value of horses on hand	\$550
cattle,	1,625
sheep and swine,	55
hay,	400
grain and other products,	450
farm implements,	350
wagons and harness,	300
*Cost of building tool house,	50

* This item does not properly belong to these accounts, but belongs to the capital of the farm.

Cost of manures purchased,.....	\$49
Amount paid for labor,.....	300
Value of board of laborers,.....	150
Value of own time and board,.....	100
Value of time and board of family,	150
Blacksmith's bill,	30
Repairs of wagons and harness,.....	25
Implements purchased,.....	25
Seed purchased,.....	35
	<hr/>
	\$4,635

January, 1860.

Present value of horses,	\$550
do cattle,	1,455
do sheep and swine,	50
do hay,	450
do grain and other products,	500
do farm implements,.....	350
do wagons, harness, &c.,.....	300
Amount received for sale of cattle,.....	675
do do sheep and lambs,.....	95
do hay sold,.....	350
do grain and other products sold,.....	355
do butter and cheese sold,.....	200
	<hr/>
	\$5,330
	4,650
	<hr/>
	\$680
Deduct the building tool house from Dr. and advance to Cr.,....	50
	<hr/>
Showing this balance,	\$730

The above statement was verified before a magistrate.

HIRAM MILLS' DAIRY FARM—MARTINSBURGH, LEWIS CO.

First Premium, \$50.

The committee, appointed for the purpose, visited the dairy farm of Mr. Mills, August 18th, and made a careful examination of the same. We were much pleased with the general appearance of the farm, and the manner in which it was managed. Mr. Mills has a reason for all that he does; and when a failure occurs in any department, he at once prepares to remedy the defect. His principal business is the dairy; though a considerable portion of the land is occupied with grain crops.

His dairy house, and its arrangements, are excellent; and the character of his butter is such as to command the highest price in market.

By a careful and thorough weeding of his grain crops, his land is kept very clear of the noxious weeds (charlock and the like), which are quite prevalent in his vicinity.

Mr. Mills' statement is so full, in answer to the inquiries propounded—that we refer to his report for a full understanding of his method in managing his farm and dairy.

Although this farm and its dairy are not perfect in every detail, yet the committee believe that Mr. Mills is fairly entitled to the premium offered by the Society, and recommend that the same be awarded to him.

BENJ. N. HUNTINGTON,

BENJ. P. JOHNSON,

Committee.

FARM STATEMENT.

1. Farm consists of 235 acres; 150 acres improved land; 75 acres wood land; 10 acres road and waste land.

2. *Soil*—A part of my farm is a clay loam, with a hard clay subsoil, and part sandy loam, with a gravelly subsoil. On a part of my farm there is some granite rock which appears above the surface, which causes the waste land spoken of. There is also a quarry of fine blue limestone, on about one acre of land, which is valuable for building. Some boulders, also, appear above the ground, most of which are removed from the tillable land and placed into fences.

3. I approve of a rotation of crops—generally sowing peas, or a mixture of peas and oats, or potatoes on green sward; second crop barley; generally seed down with barley or oats, but prefer winter wheat to seed after. I have formerly raised good crops of winter wheat, but have been obliged to abandon it on account of the midge. Great care should be taken not to plow clayey soil when too wet, as it will cause it to become lumpy and injures the crop very much. Usually plow both green sward and mellow land in the fall and plow my mellow land again in the spring, before sowing, and cultivate thoroughly. Generally seed down after the second or third crop.

4, 5. Plow from seven to nine inches deep; do not practice shallow plowing.

6. Have never used a subsoil plow. Have made surface drains with good effect; and this fall have laid 1,000 tile by way of experiment, and intend to lay more.

7. Maple, beech, elm, birch, hemlock and bass-wood, was the principal timber, and deer weed leaks and adder tongue were the principal plants indigenous to the soil.

8. I usually apply about twenty loads of manure to the acre, in its green state, spread evenly over the land, before plowing, in the spring; do not allow it to lie in the yard through the summer; think it loses nearly half its value by so doing. I think a cellar for manure, in winter, would be an improvement, to keep it from freezing, and saving of labor in drawing it out.

9. Have never made any compost manure ; have no muck at hand—usually make from 100 to 200 loads of manure annually.

10. Sometimes apply hog or horse manure to corn in the hill ; but generally plow under on spring crops.

11. As I have no muck at hand, I hardly know how I could profitably increase my supply of manure.

12. Have used lime, sown on corn, with good effect ; use plaster freely ; sow 100 lbs. per acre, on my meadows, annually, and occasionally apply some on my pastures with good success ; think it will pay to use it on grain crops generally, especially on a sandy soil. I am in the habit of using plaster and unleached ashes, mixed in equal quantities, on corn, applying one bushel to the acre, after the two first hoeings. Have never used guano, salt, or superphosphate of lime.

13. This year tilled twenty-five acres ; sowed thirteen to barley, one and a half of peas, six to oats, two and a half of oats and peas mixed, three-fourths acres of potatoes, half acre of wheat, half an acre of corn. planted corn on green sward ; plowed in the fall eight inches deep ; applied in the spring a coat of manure spread evenly over the surface, well cultivated with a two horse cultivator, followed by a fine harrow, then furrowed out and hog manure applied in the hill, and then covered two inches deep with a hoe, and then corn dropped and covered ; hills three feet apart each way ; allow four or five stalks to the hill ; plant from the 12th to the 15th of May ; use a cultivator between the rows, but never a plow ; hoe three times, but not hill up much ; keep free from weeds ; usually cut when mostly glazed, and set around a hill, and allow to cure well in the field, and then draw to the barn and husk.

Had a great growth of corn ; but having been cut down twice in the spring, by the frost, it was kept back so that the early frost in September cut it when just fit to boil, so that but a very small portion was sound.

Wheat—The wheat sown was on ground planted to corn and killed by the frost. Sowed Scotch wheat at the rate of one and a half bushels per acre ; on the 15th of June cultivated and harrowed ; and, like the corn, it was in a soft state when the frost came in September, which lessened the quality as well as the quantity, more than one-half. Yield, eight bushels on the half acre.

Barley—Thirteen acres sown—four of which were sown after peas—two sown without manure, and the two entered for premium was manured with cow manure in its green state, about twenty loads per acre. No manure on the previous crop on the four acres. One acre after corn, no manure re-applied. To previous crop, about twenty loads per acre ; two acres after peas and oats ; no manure on present crop. Previous crop manured about twenty loads per acre ; three acres, after winter wheat, manured with cow stable manure, twenty loads per acre. Previous crop no manure applied ; three acres after barley ; no manure on present crop. Previous crop manured with green cow stable manure, twenty loads per acre.

Bushels sowed per acre.—Sowed two and a half bushels of two rowed,

per acre ; sowed from the 8th to 12th May ; cut from 8th to 12th August, with a scythe. and raked with a horse rake.

The barley was mostly drawn from the winrow, letting it cure on the ground. A part, however, was put up in cocks and allowed to stand a day or two.

Two acres entered for premium yielded 122 bushels, or 61 bushels to the acre by actual weight.

Thirteen acres yielded 660 bushels, or fifty bushels per acre, 432 bushels was weighed and sold at six shillings per bushel. The balance was measured with a sealed half-bushel, and I have it on hand.

Peas.—One and a half acres sown.

Sowed $2\frac{1}{2}$ bushels white Canada peas per acre, on the 12th of May, on green sward without manure ; ground plowed in the fall eight inches deep, cultivated and harrowed well ; harvested on the 15th of August by rolling in bunches with a scythe. Thrashed in November with horses on the barn floor, and yielded thirty-seven bushels ; or twenty-four bushels per acre.

Oats and peas.—Sowed $2\frac{1}{2}$ bushels per acre (mixed half and half,) on green sward without manure, on the 12th of May, well cultivated and harrowed. Harvested about the 15th of August ; cut with a scythe and cured on the ground. This crop was injured very much by the wire worm eating out the oats. Yielded 78 bushels ; or thirty-one and one-fifth bushels per acre.

Potatoes.—Planted, the 15th of May, three-quarters of an acre of Irish cups, on green sward without manure. Rows both ways three feet apart. Potatoes cut in two or three pieces, and two pieces put in a hill, planted from twelve to fifteen bushels per acre. Hoed twice and kept free from weeds.

Used cultivator first time, and last time a plow. Soil, a clay loam. Yield, 150 bushels on three-fourths of an acre. Think the potato disease is caused by rust striking the tops (the same as grain crops,) when the potato is in its growing state, causing the tops to decay, and hence the potatoes cease to grow, and thus being retarded in their growth they become diseased. It becomes necessary, therefore, to plant on dry ground, as the tubers are much more liable to rot in wet land before harvesting. Have not been able to discover any remedy only to plant on dry soil without manure.

Oats.—Sowed about two and one-half bushels per acre on six acres of sandy loam without manure, except about one acre, on which I put about a dozen loads of horse manure after potatoes. This acre yielded about double any other acre of the field, which has never been manured at least for fifteen years. This field, laying about one mile from the barn, think it too far to haul manure with profit, hence use it mostly for pasture.

This was the third crop of oats in succession, which is a course I do not recommend to practice, but the soil being better adapted to oats than any other crop that I raise is the only reason I have to give. Yield, 260 bushels ; or forty-three and one-third bushels per acre. This field is now

seeded with timothy and clover, one peck of timothy and three pounds of clover per acre, which is the amount I usually sow.

GRASS LANDS, &C.

18. I prefer to sow timothy in the fall and clover in the spring, but as I cannot now raise winter wheat to advantage I have to seed after spring crops. Think that timothy, red and white clover are the best grasses for dairying purposes. Plaster has a tendency to bring in white clover which I consider quite equal to any for making milk.

19. Commenced haying this year 10th July, finished 30th. Mowed forty acres. Usually cut two tons per acre on an average, but this year our hay crop in this vicinity was short, owing to the ground being bare in the winter and much exposed to frost, and we also had late frosts in the spring. Yield, this year, one and one-half tons per acre. I prefer to cut grass in the second blow.

Use Buckeye machine, cut in the forenoon and cock up in the afternoon. Open next day and haul to the barn. In the latter part of haying, cut and haul the same day. Rake with a revolving rake. Use a horse pitchfork for pitching hay and grain; think my fork and fixtures pay for themselves every year. Cut and haul my hay with one span of horses.

20. My mowing land is all suitable to plow as I have removed all the stone and made them in fences. Can mow every foot with machine except corners of fences.

21. Have never practiced irrigating land to any extent; think it might be practiced to advantage on some soils.

22. Have reclaimed some peat lands by open drains, with good success, in pastures.

23. I have succeeded, thus far, in keeping the farm free from white daisies and charlock, although many farms in the vicinity are covered with them. I practice weeding the grain crops every year, so as to keep them clean. Have some Canada thistles, but manage to keep them down pretty much, by mowing. Some few tory burrs, but practice pulling them every year, and, in this way, manage to keep my farm tolerably clear of those noxious weeds.

24. I have on the farm twenty-five cows, four years old, and over; two, three years old; four heifers two years old. In all, thirty-one; equal to twenty-nine cows. Five heifers and one bull, that will be two years old in the spring; six, one year old in the spring; one, three years old, that has never given milk. Breed—Native, crossed with Durham and Devon. Have three horses. Farm work mostly done with one team; keep one for single horse.

25. Have never made any experiments to show the value of different breeds of stock for particular purposes.

26. I consider the cheapest and best mode of wintering stock, to give them warm stables, and plenty of good hay. Feed my barley and oat straw in cold weather, but feed some hay every day. Keep my stock in

the barn most of the time in stormy and in very cold weather. Think it a great saving of fodder to do so. All the feeding done in the barn.

Think it requires nearly two tons of hay, with some coarse fodder, to winter an old cow; young cattle less. When you have a plenty of straw, less hay will suffice. Usually feed some grain in the spring, after the cows "come in," to keep them in "good heart" until they go out to grass, but never after. Have spring water running in my horse-barn, for horses, brought, by hydraulic ram, from a spring twenty rods distant, and overcomes an elevation of twenty feet, with only two and a half feet fall from spring to ram. House and dairy-house supplied by the same machine. Spring walled up with stone, laid in cement and plastered. Dimensions, twelve by sixteen by three feet. The height makes the fall to ram. This machine has been in operation some twelve years, and answers a good purpose. Think it conducive to the health of my family to have good, pure running water; and also very convenient for dairying purposes, to have a plenty of the same. I have a small creek, with a good gravelly bottom, running near my barn, to which my stock have free access both summer and winter.

27. Have made 1,817 pounds of butter, and 8,225½ pounds cheese this season, which is short of common years, as the open winter had some effect on pastures, as well as on meadows.

28 and 29. Do not keep sheep. Salt kept in a trough, under cover, in the yard, to which the cattle have free access at all times of the year, except in the coldest weather in winter.

30. Usually keep four hogs and four pigs; sell the rest of my pigs when six weeks old. Breed—cross between the Suffolk and Yorkshire. Usually kill at eighteen months. Feed, in winter, slops from the house, and peas; in summer, slops from the dairy, and, two months before killing, feed oats and peas ground, mixed with milk and whey. Four, killed this year, weighed as follows: 438, 344, 345, 308; total, 1,435 pounds; average, 359 pounds.

31. Have never made any experiments to show the relative value of potatoes, turnips or other roots, in feeding animals. Usually feed barley, or oats and peas mixed, and sometimes mix with this, bran or shorts.

FRUIT.

32. I have about thirty bearing apple trees; mostly grafted, with Pound Sweets, Golden Sweets, Seek-no-further, Gilliflower, Spitzenberg, Rhode Island Greening, Swaar, Early Harvest, Lincoln, and several other varieties with whose names I am not familiar. Usually raise enough for family use. This year had sixty bushels; half grafts.

33. *Fruit Trees*.—Red cherry, Red plum, Blue plum, Peach plum, grafted into Red plum stocks. Fruit trees do not flourish with us first rate; our winters are a little too severe.

34. The caterpillars have troubled us considerable, but we kill them, when young, by wetting them in their nests with lye (not too strong), applied with a broom.

35. Keep my fruit trees well trimmed, and sometimes wash the trunks with lye, and occasionally spread a coat of manure under them to keep them thriving and fruitful.

36. Have made some other improvements, one of which I consider a decided one. I have paved my barn yard nearly all over with cobble stone, which not only adds greatly to the comfort of the stock, but facilitates greatly the hauling of manure ; for this frequently done in the spring, when the yard would be soft. and thus greatly retard the progress of the work, and instead of the cattle having to wallow through the mud knee deep, spring and fall, as I have frequently seen them do, my yard is always free from that difficulty.

FENCES, BUILDINGS, &C.

37. My dwelling house is built of wood, one and a half stories high ; upright part, 40 by 26 ; wing, 24 by 50, painted white ; applied two coats the present season on house and door yard fence. Barn, 80 by 65 feet ; main part, 50 by 35, with lean-to extending around the barn, fifteen feet wide ; main posts, twenty-two feet ; lean-to posts, twelve and a half feet ; lean-to mostly used for stabling, except a place for a granary ; and the one next the road used for a horse barn and a stable. Barn floor, fourteen feet wide, runs crosswise of the barn, sixty-five feet long ; stanchions opposite barn floor hang like gates to admit of a passage through the barn while hauling hay and grain, and this serves to make it cool when performing this work. This barn is estimated to hold as much as five 40 by 30 foot barns. Stable holds forty-six head of cattle besides horses. Find it convenient in feeding the stock, as they are in one continuous row around the barn floor and the east bay ; have an opening in the mow over the cows in the east lean-to, to throw down the fodder either from the lean-to or from the bay ; also handy feeding from the barn floor. I think I can tend forty-six head in this barn as easily as thirty head when scattered in small barns. Bays on each side of the floor are 35 by 18 feet. This barn was built in the fall of 1843, in ten weeks, (taking the timber and quite a portion of the lumber from the stump,) to take the place of five other barns that were struck by lightning and burned to the ground, in August of that year. All of said barns were filled with hay and grain ; loss estimated at \$2,600. There are no sills under the new barn except under the barn floor. The posts stand on large square stones, holes dug under them three feet deep and filled with cobble stone ; the sleepers under the stable are of white cedar, and underpinned with stone abutments. This barn has kept its original shape for sixteen years, and I consider this plan an improvement on the more common practice of using sills and framing the sleepers into them, as they frequently have to be renewed in a few years. The cost of the barn was \$600, and the plan was laid out by myself.

Dairy house stands distant from the house about eight rods ; dimensions, 64 by 24 feet, and I have constructed and joined to this, the past season,

a milking barn, 50 by 26 feet, nineteen feet posts, at an expense of \$225 ; two rows of stanchions running lengthwise of the barn ; cows stand with their heads out towards the outside, where I have windows twenty inches wide on both sides of the barn, running the whole length of the barn, to admit of a free circulation of air in warm weather. The windows are hung on hinges so they can be opened at pleasure ; step from the barn into the milk room, (i. e.,) the room in which the milk is strained, and the cheese is made. Think that one fourth of the labor is saved in milking in this way, over the more common practice of milking in the yard, to say nothing of the comfort and convenience between milking in a warm, comfortable barn, or out in the storm.

This barn is boarded up and down, and battened, and I intend to paint it in the spring, as well as the cheese house. The loft in this barn will (a part) be occupied for a shop for the farm, and the balance to store hay and corn fodder for feeding the cows spring and fall, and I also find the lower part very convenient for storing carriages and farm utensils in winter.

Corn house, 24 by 18 feet ; ice house, 12 by 12 feet, holds sufficient ice for family use, and also to cool the milk in the hottest weather. Hog house, built of stone, 30 by 30 feet, stands sixteen feet from the dairy house, and have conductors to carry the milk and the whey to the hog pen.

38. I have about fifty rods of whole wall on the farm for fence, and 100 rods of half wall, built at an expense of 10s. for the former per rod, and 8s. for the latter ; The balance of my fence is built of cedar, and black ash rails, with cedar stakes and caps, at an expense of about 75c. per rod. I have a plenty of this timber on the farm to keep it well fenced for time to come. I prefer to have my fields small, say from ten to twenty acres, and some smaller, so that when I wish to plow a field it will be disconnected from other parts of the farm occupied for other purposes. Have never constructed any wire fence.

39. Do not keep an exact account of all the products of the farm by weight, except what I market.

40. Keep farm accounts, so that at the end of the year I can tell what has been the profit or loss of farm, but do not keep an exact account with each field separately.

41. Have a market at home for all the products of the farm, (i. e.,) have purchasers to buy our produce generally, without sending it away.

(We do not deem it important to give the detailed expenses of the farm and dairy, but only the footings of the debit and credit side.

Dr.

Value of stock, implements, seeds, labor, &c., for the year, . . . \$3,707 19

Cr.

Value of stock, implements, &c., at close of year,

products of the farm on hand and sold, \$3,645 03

Products of the dairy, cheese, 706 04

Products of the dairy, butter,	\$351 05	
Pigs, calves, &c., fed in dairy,	130 50	
		<hr/>
		\$4,832 62
Leaving to credit of farm,.....	\$1,125 43	<hr/>

REMARKS.

I have aimed to be explicit in answering all the questions propounded, and you will readily observe that the expense of building the barn is not an annual expenditure, but is a permanent fixture on the farm, as also laying tile and painting the house, &c., &c., but I consider them all good investments. The difference observable in the price of hay between the debit and credit side, is the actual difference in the market in the two years. My farming utensils are kept housed both summer and winter, and I believe in having a place for everything and everything in its place.

All of which is respectfully submitted.

HIRAM MILLS.

STATE OF NEW YORK, *Lewis county*, ss :

Hiram Mills, of said county, being duly sworn, says, the foregoing statements by him subscribed are true according to the best of his knowledge and belief.

Subscribed and sworn before me by }
me, this 6th of February, 1860. }

Z. KNOX, *Justice of the Peace*.

JAMES ZOLLER'S DAIRY FARM.

FARM REPORT.

James Zoller's farm of Oswegatchie, devoted to the dairy (butter), comprizing 250 acres, was visited by Benj. N. Huntington and B. P. Johnson, two of the committee appointed to examine the same, on the 17th September.

The farm is not in a very good state of cultivation, and there is not such attention given to its general arrangement, fences, buildings, &c., as to require particular notice. Mr. Zoller has erected him a new house, which is convenient; is also adding to his barns, and when his arrangements shall have been completed, the farm itself will be in a better condition, doubtless, than at present, and better prepared for competition for the premiums of the Society.

The dairy is the main business of Mr. Zoller, and he has in his dairy, during the summer months, pursued a different course from most dairymen, and which seems to be successful.

Early in the spring and late in the fall he sets his milk, and churns the cream in the usual manner.

In the summer, he strains one day's milk into six churns, and churns the next morning by horse power, the milk being sour, but not loppered.

He churns the milk in preference to the cream, because it is *less labor* (this was very apparent to us, and probably one hand's labor is saved in his dairy); and, also, *because he obtains more butter from the same quantity of milk*. The milk is left to sour, because the butter is more readily produced than from fresh milk.

The butter is freed from the milk and whey, by washing in cold hard water; and when the milk is washed out, the butter is put in a butter worker and rolled with a heavy smooth roller, using no water. This renders the butter free from all milk or whey. He uses water in freeing from milk, because, from his experience, it is the better mode.

Salts with ground rock salt, suited to the taste. We examined Mr. Zoller's butter, which he had made during the season, which was kept in his cellar on a stone bottom, the cellar well ventilated; found it in good condition and of fair quality, though, not in our judgment, of the very highest grade. It had been examined, however, by the leading butter buyer in that region, and who is an excellent judge, who had offered for the whole dairy, as we were informed, the highest market price at that time.

Mr. Zoller's cows are what are called native, crossed with Durhams.

We desired Mr. Zoller to make an experiment as to the two modes of making butter, so as to furnish us the result. He has done this, and the result is as follows:

Sept. 10. Took 208 quarts of milk and strained into pans—set till the cream had thoroughly risen—skimmed and churned cold—*produced 17½ lbs. of butter*, ready for packing.

Sept. 11. Took 208 quarts of milk, strained into the churns, stood till sour, but not loppered, churned and treated in same manner; gave 19½ *butter* ready for packing; being a gain of ten per cent over churning the cream.

This, Mr. Zoller believes, is about the fair difference between the two methods; and if uniformly this result is secured, it certainly is an important advantage.

It will be seen by this experiment that 10 62-77 quarts of milk produced a pound of butter, which is a much less quantity of milk than the average returns of our dairies. Mr. Zoller is of the opinion that this is about the average amount of milk required under his system, under ordinary circumstances; but a trial, during the entire season, would probably alter this average.

We think there is enough furnished by this experiment of Mr. Zoller's, which has been continued for some time past, to lead others carefully to test this practice. If 10 per cent can be secured over the ordinary method of churning the cream, and if an *equally good quality of butter can be made*, it will need little urging to induce our dairy men to give attention to it.

It is to be regretted that Mr. Zoller has not given us the receipts and expenditures of his farm and dairy, as required by the regulations of the

Society. The amount of butter even, for the whole season, is not furnished us.

Mr. Zoller does not keep any farm accounts, and says he cannot, therefore, give the receipts and expenditures of his farm.

How much better would it have been had he adopted a system of daily accounts, in which all his receipts and expenditures would have appeared ; and then instead of reporting, as he does, "the result of the year's operation *is highly satisfactory*," he would have been enabled to show, in what direction of his labors it had been made so ; and doubtless he would have seen, in some portion of his labors, where the result was a loss instead of gain—and which knowing, another year would have corrected it, and thus enabled him to have added, *still more highly satisfactory* than last year.

We were gratified in our visit to the farms in St. Lawrence. The general aspect of the farms which we visited, was very gratifying to us. Mr. Solomon Walrath's premium farm was examined ; Mr. W. kindly affording us the comforts of his snug home for one night. We were satisfied that he is continuing the good work begun on his small farm ; and we were satisfied that his labors were well and advantageously directed ; and that he was justly entitled to the awards which had been given him.

We recommend an award to Mr. Zoller, of three volumes of Transactions of the Society.

All which is respectfully submitted.

B. P. JOHNSON,

BENJ. N. HUNTINGTON, .

Committee.

THE DAIRY—CHEESE AND BUTTER.

A. L. FISH—CEDARVILLE, HERKIMER COUNTY.

CHEESE STATEMENT.

With a view of testing the effect of acid upon sweet milk, to remedy porosity in cheese, caused by swelling (or puffing), one gallon of sour whey was added to sufficient rennet liquor to curd the milk for one hundred pounds of cheese, the milk being warmed, as usual, to ninety degrees heat (Fahrenheit), by warm water passing around the vat containing the milk. Rennet enough to curd the milk firmly in forty minutes, was mixed with the gallon of whey and thoroughly mixed with the milk, and left to stand undisturbed one hour; it is then subdivided by passing a gang of knives, fifty-six in number, set one-quarter of an inch apart, through the mass in several directions, to cut it into square lumps one-quarter of an inch square, evenly and at the same time, the object of which is, to divide into particles of an even size and age, so that heat will have an even effect in cooking, or scalding. No more cutting or breaking is needed; a gentle motion, by stirring the mass, is required to prevent sticking together, or reunion of particles. Heat is raised slowly, to keep even pace with effect of rennet; usually about one hour in raising it to 100 degrees, which is the maximum. Heat is held at full 100 degrees till curd appears sufficiently shrunken and cooked, which varies from one to two hours, sweet milk requiring more heat than when acid is applied with rennet. When curd is so cooked as to spring apart elastic, on being pressed together with the hands, and squeaks well on being pressed by the front teeth, it is judged to be in a condition to drain off the whey, and salt. The whey is then drained off, and curd pressed by the hands, to rid the whey as much as possible, and one pound of Liverpool ground salt added to forty pounds of curd, and put to press warm, so that the whey will press out more thoroughly than if allowed to stand and get cold and stubborn. Pressed with two tons' weight; turned, in six hours, into clean cloth, and pressed twelve hours, and taken from hoop; left to stand several hours, to dry the rind to receive a coat of hot oil of whey butter; turned daily, and oiled and rubbed, to keep rind from cracking, and smooth. Temperature of curing room kept to not exceed seventy degrees (Fahrenheit), by ice in an adjacent room, cool air from which passes into cheese room through a door in a dividing partition, when required. When the temperature of weather is cool, milk is warmed more to set, than in warm weather, because it will cool more in

working before scalding, and it is necessary to preserve a heat while working not below eighty-four degrees, to keep the rennet active. The richer the milk the more scalding is required, and more salt, as a rich curd will reject salt, when a poor curd will absorb and retain it; rich curd has a tendency to more rapid fermentation than poor curd, and requires more salt to check it than poor curd.

Calves' Rennet.—Only are used, after being kept dry one year; then soaked in half gallon soft water each, and rubbed often in course of twelve hours, then changed to same quantity of new water, and treated as before; then taken out, and both liquors put together and made as salt as can be, and strained and skimmed, and put into a jar for use; then, by stirring before using each time, a uniform strength may be relied upon daily, of sweet sharp rennet, and, if heat is properly applied, there will be no trouble of cloth sticking to cheese when pressed, if all are kept sweet. But if rennet is allowed to sour in curing, or sours in soaking, or gets weakened any way, by being kept in a damp atmosphere, &c., there may be troubles of various kinds, without remedy. A little coloring is added at a season when needed, by rubbing a cloth, or small bag containing a lump of annatto, in the liquor containing the rennet, so that it is incorporated with the milk. When the milk is rich enough to make curd a cream color, and cheese a butter color, no annatto is used. It is found by adding sour whey with rennet to set curd, that it facilitates the effect of rennet, and prevents cheese puffing, without reducing the weight of cheese from a given amount of milk, as when allowed to become acidulated from other causes. It is also found that cheese will retain more weight when cured in a room not exceeding seventy degrees heat, than when allowed to run higher.

A. L. FISH.

ELISHA PECK.

FABIUS, Sept. 30th, 1859.

Gentlemen—I would say to you, the two cheeses brought here for exhibition were made the last days of June. My process in making is briefly as follows: After my milk is all ready in a large cheese tub, I put in the rennet and stir it thoroughly with the hand. I let it stand thirty or forty minutes, and cut it with a long, thin bladed knife. I let it stand about one hour, and I dip it into a strainer, lying over a sink, and cut it a few times; I leave it till morning. I take the same course with the morning's milk as mentioned above. In the morning, both curds very fine for scalding; I put in the morning's curd first to scald; after that is well warmed up, I put in my evening's curd into a whey heated a little over blood heat; when I think it sufficiently scalded, I dip it out into a strainer laid over the sink, and let it drain quite dry. I take a common sized teacup even full of fine solar salt, and put one teacup full to every twenty pounds of curd; after mixing the salt well with curd, I

put to press, and let it stand twenty-four hours. I keep seventy-six cows ; make from 250 cheeses to 260 in the best of seasons.

ELISHA PECK.

STATEMENT OF THE MANUFACTURE OF CHEESE.

BY A. B. MACK, OF WESTPORT, ESSEX CO.

The cheese exhibited was made the 15th day of June last, and weighs now 116 pounds.

The following answers to questions put by the Society will show the method of making :

1. I warm only a part of the milk, and mix it with the rest till I bring it up to eighty-five degrees.

2. I add the rennet at eighty-five degrees, because that is the best condition, in my opinion.

3. I vary the heat at setting some, heating a little more in cool weather, because it cools off faster.

4. I use calves' rennets, prepared as follows : Salted very much when taken from the calf, with the curd, if any, and dried on plates. I put four of these to four gallons of water, some sage, and sufficient salt to keep it sweet, say one quart. After five or six days strain off and keep in a cool place ; use one pint of this liquid to 100 pounds curd ; more, if necessary.

5. I cut the curd each way with a long wooden knife, and then break it fine with the hands ; let the curd settle, and dip off most of the whey.

6. No rule observed.

7. No particular rule, only when it is settled enough.

8. I apply heat by heating whey in a long tin pail, set in boiling water until it comes up to 100 degrees ; about one hour in doing it.

9. Answered in number three.

10. By the heat, the time, and the feeling and appearance of the curd.

11. I dip out all the whey, and some curd with it, into a basket, covered with a strainer set in a sink, from which the whey is carried by a spout into the hog pen ; stir the curd all together, let it cool some before putting in the salt.

12. I use Ashton salt, two and a half pounds to 100 pounds curd ; mix thoroughly with the hands till cool.

13. Put to press as soon as cool enough ; if too warm the cheese is more likely to be strong.

14. I use two presses ; one the self pressure, the other the old fashioned lever press ; usually divide the curd, as small cheeses cure quicker.

15. The principal cause of the pressing cloth adhering to the cheese, is the curd being put in too hot ; my remedy is to keep everything sweet and clean, and great care as to the state of the curd.

16. I give coloring to the cheese by coloring the bandage cloth before using it, and a little otter in the grease.

17. I produce a rind by greasing and rubbing every day.

18. I use butter and clean grease, applied with the hands.
 19. Hot weather and insufficient scalding and salting, the cause of swelling. Remedy, cook and salt a little more in hot weather.
 20. I used a thermometer formerly, but not this year.
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HIRAM MILLS—LEWIS COUNTY.

CHEESE STATEMENT.

The three cheeses offered for inspection were made about the middle of June, from thirty-one cows and heifers, or as I estimated them in my report to the committee on farms, at 29 cows.

1. My mode of making cheese is as follows :

Milk strained in a tin vat set within a wooden vat, with a space of an inch on both sides and bottom, which is filled with cold well water when we begin to milk at night, which water will become as warm as the milk by the time we are through milking.

This water is then drawn off and the space again filled with cold water, and in the warmest weather I put a cake of ice into the milk at night, using great care to have the animal heat all extracted, believing it to be impossible to make a good article of cheese from milk that is changed, and hence the precaution taken to keep it perfectly sweet.

2. This water is drawn off in the morning, and steam admitted in its place to bring the milk to the temperature of eighty-five degrees before applying the rennet. Use some heat at all seasons, as I find the milk will be below this temperature even in the warmest weather, and I find that I get the best curd and the best yield at about that temperature

3. Bring the milk to this temperature at all seasons for the reason above given.

4. Use calves' and hogs' rennets mixed, I save rennets by stretching them well on a bow, salted freely, taking care to have them dry well so as to keep perfectly sweet as I think it a thing impossible to make a good cheese from rennet tainted in the least.

Prepare them for use by soaking in water a number of days and then throwing the skins away, and then salt freely. Use enough rennet to bring the curd in about forty minutes sufficiently hard to work, which I can tell by passing my finger through the curd, and if sufficiently hard there will be a little space left in the curd behind the finger.

5. Use a steel knife with four blades to make the curd fine, as I find I can do this work much quicker and better than to do it all with the hands. I think this knife far better than the old fashioned tin cutters. I make my curd very fine ; this causes it to scald more evenly, and I think it makes better cheese.

6. I dip off a part of the whey before this operation is completed as I can work it to better advantage, and it requires less heat to scald the curd.

7. I then commence to raise the heat by the addition of steam into the space under the tub, by means of one of Brayton's Dairy Steamers, which

I consider a decided improvement over any other steamer that I have seen, as it is a great saving of wood as well as labor, as there is no dipping of whey or water back and forth, and I think it scalds the curd more evenly than when warm water is used, and the waste steam is used when not wanted for this purpose to warm water for washing up the dairy utensils.

8. The space of about an hour is generally taken to complete this operation, raising the heat by degrees, and stirring quite a portion of the time, to keep the curd from adhering together, and to get it evenly cooked.

9. I aim to bring the heat about the same temperature, viz., 102° at all seasons, using, of course, more heat to effect this in cold than in warm weather.

10. Consider it cooked enough when it will adhere together by squeezing it in the hand and the whey runs clear.

11. The curd and whey are then dipped together into a strainer over a rack in a sink, care being taken to stir it sufficiently to keep it from adhering together, and as soon as the whey is sufficiently drained off, apply about a teacup of salt to eighteen pounds of curd.

12. Commonly use Salina salt, which should be thoroughly mixed in, stirring it well until it becomes cool.

13. Should never be put to press too warm, because that will cause it to adhere to the cloth, and I think injures very much the flavor of the cheese.

14. Press with lever or beam press. The lever being in a room above, and a large post, fourteen inches square, framed into this lever or beam, and passing down through the floor between two upright plank, which forms the frame for the press.

This post being large, presses the follower down square, and thus pressing the cheese true, which is very desirable. This beam being sixteen feet long, with a short purchase, is a powerful press. Think it important to press the cheese well. Press twenty-four hours, turn at night and bandage.

15. There are other causes for pressing cloth adhering to the cheese, one of which is the cloth, or the hoop follower, or pressing board getting sour, which they are very liable to do; hence the necessity of scalding them every day. And I would here remark, that I deem it of great importance to see that every thing connected with the dairy is kept perfectly sweet; and to assist in this direction, I give all my cheese fixtures a coat of paint every year.

16. To give coloring to the cheese, I add annatto (prepared in lye) to the milk to give it an orange color inside, and on the outside, color with the same, mixed with whey butter, which should be mixed with the butter when boiling hot, or it will settle to the bottom of the vessel in which it is prepared, after allowed to cool.

17. To form a rind impervious to flies, I put a cloth on the top and bottom of the cheese, at the time I turn in press, and allow them to remain on the cheese for six or seven days, then take them off and apply a coat of grease as warm as I can bear with the hand. In this way I get a better rind, at an age of seven days, than you can get in a month in the more

common way of applying the grease when taken from the press. And this gives the whey a good chance to pass off if there is any left in the cheese, and it is in a better state to hold the coloring applied.

18. Answered in No. 16.

19. The cause of swelling in cheese is a deficiency both in scalding and salting ; and if the curd is not well worked, the cheese will have the same tendency.

20. Always use a thermometer to test the degree of heat. Think it the only true guide, as the sense of feeling will apparently change in warm and cold weather.

21, 22. Breed of cows—Native, crossed with Durham and Devon. Have not tested blooded stock to see the difference.

REMARKS.

Cheese made from two milkings, no addition of cream. I always make butter from the cream taken from the tub in the morning, thinking it difficult to get the cream again into a state to get its full value in cheese ; for after it is once separated from the milk, it will rise again to the surface before the rennet takes effect sufficiently to turn it to curd—hence a portion of its value passes off in the whey. I therefore think it more profitable to make it into butter, except in the warmest weather.

HIRAM MILLS.

BUTTER STATEMENT.

F. B. RUGG—WEST TURIN, LEWIS COUNTY.

Method of making butter, together with answers required by this Society.

1. The butter of my dairy of forty tubs, was made from twenty-seven cows, between the 10th of May and 10th of November ; and the samples which I here exhibit, were made in the months of June, August and November.

2. Milk set in tin pans, in a stone milk-room. Cream taken off as soon as milk becomes loppered.

3. Butter worked with a wooden ladle, and laid by for twenty-four hours ; then reworked until the buttermilk is fully freed from the butter, and then packed in ash tubs.

4. We use ice-water, in extremely warm weather, to free the butter from the milk.

5. We use one ounce of Ashton salt to one pound of butter. We use no other.

6. We use no saltpeter, or any ingredient, to make butter better.

7. Common barrel salt, from Salina, is not good for packing butter ; it has too much lime in it.

8. Our butter is packed in ash tubs, and covered with a cloth, and salt sufficient to exclude the air.

E. CROFOOT—TURIN.

BUTTER STATEMENT.

This butter is selected from my dairy of about 3,500 pounds, made from twenty-five cows. My method of manufacture is:

1. I strain the milk into tin pans, about three inches deep, and set in a cool place, to stand till ready to skim, which is done as soon as it commences to curdle. Stir the cream after each skimming, and keep it in large coolers, which are set (in hot weather) in a tub of cold water over night, before churning. In hot weather, we churn very early in the morning, setting the churn in a tub of very cold water. We have no trouble with the butter coming soft. 2nd. When the butter is well gathered, we take it out into a large bowl, and rinse it with cold water until the butter-milk is all out; then salt, with Ashton salt, to suit the taste; then set in a cool cellar twenty-four hours; then rework and pack. We use no other substance but salt to preserve the butter. My milk room is on the north side of other buildings, and shaded by trees. I use a dash churn, propelled by a dog. We churn about thirty pounds at a time.

HIRAM OLNSTEAD—WALTON, DELAWARE COUNTY.

BUTTER DAIRY.

Statement of a dairy kept by Hiram Olmstead, during the year 1859.

The whole number of cows milked, from which butter has been made the past season, has been twelve, from five to thirteen years old, and two three years old, and one two years old; making fifteen in all, old and young. The cows came in between the middle of March and the first of June, and are of the Native breed, except one grade Durham and three grade Devons. They have been wintered on hay and straw. No grain has been fed, but each cow has had about eight quarts of roots during that part of the winter that they were milked.

Butter sold in New York, 2,728 lbs.,	\$602 38
Consumed in family, and remaining unsold, 517 lbs., at 21 cts.,	108 57
Value of milk fed to hogs, after deducting other feed,	96 00
do do calves,	9 00
Thirteen deacon skins, at 87½ cts.,	11 37
Total income,	\$827 32
Less packages,	\$24 38
salt,	2 08
freight, cartage and commissions,	33 16
	<hr/> 59 54
Net income from all sources,	<hr/> \$767 78

Whole amount of butter made, 3,245 pounds. Average to each cow, after deducting for heifers, 229 pounds. Net income from each cow, after

deducting for heifers, \$54.19. The butter sold for a fraction over twenty-two cents per pound, it being two cents less than the dairy has sold for in six or eight years.

A deduction of one-third for two year olds, and one-fourth for three year olds, is made in the statement above.

HIRAM OLMSTEAD.

Sworn and subscribed, this 31st day }
of December, 1859, before me. }

S. H. WHITE, *Justice of the Peace.*

EDWARD HOYT'S BUTTER DAIRY.

My dairy consisted of six native cows; *two* of them were seven years old, *one* six, *one* five, and *two* three year old heifers, and calved between the 10th and 26th of March. The said cows were wintered on hay, with a few roots; after they came in they received one pint of corn and oat meal each, per day, till grass; during the summer, their feed was grass only.

The butter, except what was consumed in the family, was sold in New York.

QUANTITY.

The whole amount of butter made from these six cows, the past year, was 1,230 lbs; being an average on each of the six cows, of 205 lbs. to each cow; or if one-quarter be deducted for each of the two three year old heifers, then the average quantity on five and a half cows, would be 223 7-11 lbs. to each cow.

INCOME.

Whole amount of butter sold, 1,085 lbs., amounting to	\$230 61
do do used in family, 145 lbs., amounting to..	30 45
New and skim milk fed to calves and colt brought up by hand,..	18 50
Milk and cream used in family,	10 50
Pork, made from the slop of the dairy,	30 50
One veal,	5 50
Three deacon skins, sold at eighty cents,	2 40
	<hr/>
	\$328 46
Less expense of salt, firkins, freight and commission,	20 26
	<hr/>

Net proceeds of the dairy, \$308 20
or an average on each of the six cows, of \$51.37; or if one-fourth be deducted for the two heifers, the average on five and a half cows would be \$56.04 to the cow.

EDWARD HOYT.

WALTON, *February 4th*, 1860.

Affidavit as required.

The manner in which the butter, in the above statement, was manufactured:

My cows are milked regularly each day, at a stated period ; each cow is milked by the same hand, and the milk is drawn as quickly as is consistent with the quiet and comfort of the cow ; the milk is strained into large pans, about two inches deep, and set in a cool buttery till it sours or begins to lopper ; the cream is then taken off, and the churning is usually done each morning, with a dash churn, attached to a tread-wheel, propelled by sheep power ; the cream is tempered by a thermometer, at about 62 to 64 degrees ; the butter is cleared of the buttermilk, by washing in cold water, then salted, by judgment, with Ashton salt, to suit the market, probably at the rate of about one ounce to the pound, and well worked in ; allowed to stand in a cool cellar till the next day ; it is again worked and packed down solid in the firkin, and when full, covered with a clean cloth, and the chime filled with fine salt and brine, and kept full till ready for market ; but care should be taken that no part of the cloth hangs over the edge of the firkin, to act as a siphon to conduct off the brine and soil the package ; cover the firkin with a smooth and clean flat stone, and keep in a cool, dry cellar, where there is not too much air, and the work is done.

EDWARD HOYT.

WALTON, DELAWARE CO., N. Y., Feb. 4, 1860.

ZADOCK PRATT'S DAIRY FARM, 1859.

PRATTSVILLE, GREENE COUNTY, Dec. 15, 1859.

COL. B. P. JOHNSON, *Secretary* :

Sir—In the last year's report of the State Agricultural Society, you were pleased to publish the account which I submitted of my dairy farm for the years 1857 and 1858, and your courtesy at that time induces me to offer for your consideration a like account for 1858-59. Referring to my former communication I have to give the following figures, observing now that I have employed the same help upon the farm as I did then.

Butter.

	1857	1858	1859
Fifty cows realized,	6,500 lbs.	8,050 lbs.	8,300 lbs.
Average number of lbs. to each cow, ...	130	161	166
My butter netted me this year,			\$2,070 00
Hogs' weight, 6,455 lbs,			418 00
Total,			\$2,488 00
From this deduct on farm investment, interest,		\$700	
Labor on farm and repairs,		850	
			1,550 00
Making the net gain for the year,			\$938 00

My farm, stock, &c., is valued at \$10,000. Within the past year I have set out 1400 sugar maple trees, and a few elm and beech trees.

Raised 500 bushels of corn, 700 bushels of carrots, 300 bushels of potatoes, 200 bushels of turnips, 70 tons of hay, 50 tons of corn-fodder and stalks.

The subject of manures is, we all know, attracting considerable attention throughout the country, and it may not be out of place for me to state what I am doing in this matter.

I have a large wagon (bark rack) of the capacity, of say, two cords; this I send, with a man and all the idle boys I find in the village, to the woods, where they rake up from two to three loads a day, these leaves are carried to the hog-pens and the barns where they serve as bedding to the stock; and when well mixed with the other manure (throwing in occasionally a barrel of wood ashes and a load of old spent tan bark as a decomposer of the leaves,) they go to the manure heaps or on the land. I am satisfied with my experience thus far in making this kind of manure. This with the care given to the farm has nearly doubled its value. From three acres of land on the side hill I have cut twelve tons of clover and timothy hay the past season at one mowing.

My practice is to put on manure both spring and fall, raking it fine and level ready for the scythe. My cows are, with one exception, natives; I stable them in winter and feed them about two quarts of meal per day through the spring, with all the hay and stalks they want. I have for them in the yard a never failing, never freezing trough of spring water, and to which, summer and winter, they can go at pleasure, and I can't help thinking that they are all the better for this privilege.

In this connection let me add that I have raised a native heifer calf, which for good points can hardly be improved, not yet a year old, which weighs 750 lbs. gaining about two pounds per day, the mother of the calf weighs 860 pounds. Both the cow and calf furnished with meal occasionally, and this confirms me in the opinion I have held for a long time, that the keep will do very much to improve the breed. A recent examination of stock farms in England, and viewing the cattle in London market from nearly every country in Europe has not lessened my faith in this matter.

I am yours truly,

Z. PRATT.

THE DAIRY.

PRACTICAL FARMING, AS CONNECTED WITH THE MANUFACTURE OF BUTTER, BY HIRAM OLMSTEAD.

FARMING, AS CONNECTED WITH THE BUTTER DAIRY.

The number engaged in the manufacture of butter, has been increasing for years, until, in many parts of our country, it has become the principal business, engaging the attention of the farming community. The amount of butter manufactured annually, at the present time, as compared with former years, is largely on the increase; while the demand for the article has increased in a proportional ratio. It used to be said of the business that it would be overdone, but experience has proved otherwise. That produced one year may accumulate in the markets, and prices may rule low—but it is ready, at all times, to yield its place for that which is fresh made, and it is eagerly sought after, at increased prices, as compared with the old. There are many essential, and many that might be called non-essential things, that combine to make a man successful in the dairy business. First and foremost among these the dairyman should have a farm naturally inclined to grass, an abundance of pure cold water, and an experienced dairy-maid. Combine with these industry, perseverance, and a close application to the business, will ensure success. There is no business connected with farming, that requires closer attention than the manufacture of good butter; and, at the same time, it is among the most lucrative employments that can engage the attention of farmers.

COWS.

It is the practice of many dairymen to buy their cows. When this practice is pursued, to keep up the supply of cows, care should be exercised to buy only good ones. A dairyman is a poor person to go to to buy good cows. If he has any poor ones, they are the ones that he will want to sell. Better pay fifty dollars for a good young cow, than take an inferior one at thirty. The good one may make enough more butter the first year, to pay the difference.

If a man wishes to buy a dairy of cows, for beauty, with a handsome red color, nice horns, and a trim, snug, sprightly appearance, let him go to the Devons. If he wants to get those of large size, and good consumers, and those that will make the most beef when he is done milking them, let him go to the Durhams and Herefords; but if he wishes to buy a profitable cow for the dairy, he will quite as likely find it among the Ayrshires or

the common native stock of the country, as any where. By this it is not claimed that good cows cannot be found among the breeds first named; but that he may be as successful in the last named breed as in any other. There are many external marks about a cow that will indicate her milking qualities.

A slim head, neck and horns, rather light in the shoulder, broad across the loin, heavy in the hind quarters, yellow skin, a hearty disposition to eat, and a good capacity for storing food, are points usually found in a good cow.

The observations of Guenon, as indicated by the escutcheon, will be of much service in selecting cows. The best way, after all, to find out the good and poor cows of the yard, is to see how much butter each cow will make in a given length of time. Such an experiment should be made in different seasons, and at different times in the season. Experiments of this kind will cost time and trouble, but may be valuable to the dairyman. Cows are apt to vary in the amount of butter they will make in different seasons. This variation is more apparent in young cows than with those of mature age. The man whose business it is to sell milk, will, of course, look for such cows as will give the largest quantity. The quantity of milk that a cow may give, may deceive a man very much as to the true value of the cow for making butter; and cows may be retained in the dairy because they give a large quantity, and others may be disposed of because they give a small quantity, when the truth is, the poor cows are kept and the good ones are disposed of. Another, and better way to keep up the supply of cows in the dairy, is not to depend upon buying, but to raise them. Select such cows as are known to be of a good milking family. Have them come in early; and, of course, they should be dried early, and from such cows raise the calves. Cows that have been stripped late, and close, will have smaller and poorer calves than those that go dry longer. When a cow first comes in she should not be allowed to drink hearty of cold water, in cold weather; but the slop, or water, should be made about blood warm. The calf should be taken from the cow, and fed with a reasonable quantity of new milk twice a day, for two or three weeks, and, by degrees, change from sweet to sour milk, and then begin to add a little meal. The calf should have milk, and good pasture, through the summer, and in the fall and winter fed on roots and rowen hay. At two years old the young cow should begin to give milk, and if she is raised as described above, with care, she will be worth about as much, or perhaps more, than those more neglected will be at three years old. A calf that shows a dainty, shy disposition when young, will be apt to retain it through life. Select those that will take hold of their mess with life, and drink it up with a will. Heifers should be handled occasionally before they come in. This will help very much about breaking them to milk. In learning them to be milked, take hold of the teats so as not to hurt them, and use mild, gentle means, and never get in a passion. Mild means will be more likely to make a heifer gentle to milk than harsh ones. The cows should be milked morning and evening,

so as to divide the time equally between milkings, especially when they are in their greatest flow. Let each milker milk the same cows. The fingers should not be doubled up, so as to bring the ends of the nails against the teats. The fingers should be lapped around the teats so as not to hurt. Use both hands, and after the cow is begun, milk right along, with persevering industry, until all is drawn. No after-stripping should be allowed. Scolding, thumping, and stoning of cows, is entirely uncalled for. Cows should never be dogged, or run; everything of this kind will tend to lessen the quantity of milk that they will. Cows should be turned off at about fifteen years old. In a dairy of fourteen or fifteen cows, raise a heifer calf, and have a two year old to come in each spring, and dispose of the oldest cow in the fall. By adopting this practice, the dairy will be kept uniform, as good one year as another. If the dairy should number about twenty, it would be necessary to raise two calves every other year, to keep up the supply. The male used from which calves are raised, should be selected from a good milking family, with as much care as the females. The cows should go dry from two to three months. After a cow is dried, she should be milked once or twice a week, for two or three weeks, to prevent the bag from injury. Full grown cows, with good care, should average two hundred pounds of butter during the season, or more. A cow that will not make one hundred and fifty pounds, should be rejected as inferior.

BUTTER MAKING.

Butter is one of the necessary articles of the table. No table is complete without good butter. Much of it that has been well manufactured is spoiled before it reaches the table where it is consumed. It is a delicate article, and is easily affected by being exposed to the air, and especially to impure air, in warm weather. As soon as the milk is milked, it should be strained into tin pans, holding eight or ten quarts, filled less than half full in warm weather, up to nearly full in cool weather, and set in a cool airy milk room. The cream will commence to rise immediately, and will increase in quantity for a given length of time, when it will diminish in quantity and quality. It should be skimmed at the time when it is the best, which is about the time that the milk begins to thicken on the bottom of the pan. The cream should be allowed to stand from six to twelve hours, and stirred occasionally before churning, and strained through a wire sieve to prevent white specks in the butter. Every dairy maid should have a thermometer to regulate the temperature of the cream before churning. The temperature of the cream should vary from 60° in cold, to 66° in warm weather, (Fahrenheit.) Hot water should not be put into the cream to temper it; but the cream should be put in a tin pail, and then immersed in warm water. Ice is of great service in extreme warm weather. The churning will occupy a longer or shorter time in different parts of the season. If the cows are fresh in milk, the butter should come in about half an hour. Later in the season it will take about an hour. Butter is injured by churning too long, and should not come in too short a time. It

is difficult to manage the cream late in the fall, so as not to have the churning occupy an unreasonable length of time. The following are some of the causes that delay the butter from coming. The milk has been kept too cold, and prevented the cream from souring. Sour and sweet cream may have been mixed. The cream from farrow cows may have been mixed with cream from those that are not farrow. The cream may not have been sufficiently warmed, and the cows may have lacked salt while fed on dry food. The milk may have stood too long before it began to change. These should all be guarded against. After the butter has come, take it out of the churn into a wooden bowl. The next and important work to be done, is to extract the buttermilk and salt it. How is it to be done? One will direct that the butter should be washed. Another will say no water should be used to get out the buttermilk. If the butter has come solid and good, good butter can be made of it either by washing or not, if properly worked. If the butter has come soft, and looks light color, cold water will improve it.

The true principle to work it, is to cut and press out the buttermilk; not to sleek it over as you would to spread it on bread. If worked too much, it will be dry, and the grain will be injured. If worked too little, it will not keep good, in consequence of the milk it contains. The brine will always be clear when the milk is all out. It should be salted after the first working, when it comes from the churn, with one ounce of Ashton salt to a pound of butter. Allow it to stand from fifteen to twenty hours, for the salt to dissolve, and work it until the brine is clear, then pack it.

PACKAGES.

The best package for butter, is a good white oak firkin, with hickory hoops, made in a workmanlike manner, without being scorched on the inside, and so that it will not crack. The size of the firkins should depend upon the market the butter is designed for. In some markets an eighty weight will bring one cent per pound more than a hundred weight package. In other markets, no difference will be made if the firkins are large or small. The cost for packages made large, is no more than small. The freight is usually the same. If the market will answer, it is always best to use large firkins.

The firkins designed to be used should be procured in season, and should be uniform. Nothing lost in having good, handsome firkins. Before one is wanted for use, it should be weighed, the tare and number marked on the head, then opened and filled with brine, for two reasons; one is to make sure that it does not leak, and another is to salt the wood. If the wood is not thus soaked, it will extract the salt from the butter that comes in contact with the wood, and be an injury to it. When the package is wanted, open the second and empty the brine from the first into it, and so continue. When a package is filled with butter, spread a cloth over the top, and put on salt. Add water to keep it covered with brine. Cover the whole with a thin flat stone, and set it in a cool place. The brine will

exclude the air, and if the butter is well manufactured, it will keep good. When it is ready for market, take off the brine and cloth, cover the butter with a clean cloth, and sprinkle on a little salt, and head up the firkin. The object of the cloth on the top, is to prevent the chats from falling on the butter in opening; and when the cloth is removed, it will present a much more inviting appearance. If the firkins have soaked through, so as to stain the outside, they should be wiped with a damp cloth, and they will then soon dry. The hoops should be well nailed, but not so as to have the nails go into the butter.

Every dairyman should endeavor to make butter that he is not ashamed of, and after it is made, he should have his name plainly marked upon each package.

CHURNS.

There is almost an endless variety of churns in use, and each variety has its advocates. Among them all, for simplicity, durability and efficiency combined, the common dash churn stands unrivalled, and is most generally used.

POWER FOR CHURNING.

What is the cheapest, most durable, and most efficient power for churning? is a question that should claim the attention of every dairyman. The hand power, dog, sheep, and water powers, are those usually employed for churning. Which is to be preferred, is the question. The dearest of these named, is the hand power. No one milking three cows, can afford to churn by hand. The tax of time and patience to do up the churning at all times when it should be done, is sufficient to prevent many from entering into the business; and reasonable men will not require the women to do the churning. A water power answers a very good purpose for those situated so as to employ it, but is expensive to establish and keep in repair, owing to the liability to decay. One objection to this power is its expense, and a second is its inefficiency in dry seasons. Those relying on this power are obliged to consent to churn by hand about one-fourth of the time.

A dog power answers a good purpose, but the expense of keeping a great dog is about equal to keeping a hog the same length of time, and nine-tenths of the dogs of the country are a decided detriment to their owners, and a scourge to all of the neighbors living within range of their nightly perambulations. When used to save steps they are about as apt to make ten as save one, besides the damage done to stock by being chased by them. Churning is about as good use as a dog can be put to. Unquestionably a power propelled by sheep is much the cheapest, and most efficient of any of those in use. A sheep will churn two or three times a day, even in warm weather, without inconvenience; is much less expensive to keep than a dog, as its food is mostly grass; and it will produce more wool than the ordinary sheep of the flock. Select those of the coarse wool variety, as they will stand the heat well, and are inclined to be mild in disposition. They soon

learn to drink buttermilk and grow large and fleshy. Procure a chain fifteen or twenty feet long to fasten them; change their place to feed every day; and when the churning is over in the fall, let them go with the flock, and they are no more trouble until wanted in the spring.

A sheep will churn the butter from twenty cows. If more cows are milked it might be necessary to have two sheep. How long they will live I am not able to say, but was acquainted with one that was used in a dairy of from twelve to fifteen cows until he was eighteen years old, and then he was butchered; a second that was used until he was seventeen years old; and a third that has churned from two to three thousand lbs. of butter yearly, and is now thirteen years old, and has every appearance of doing good service for years to come. The powers are usually made on the endless chain principle, or the circular wheel. If the endless chain is used, the slats or floor should be made on the same plan as the horse power, not fastened to a belt as they are liable to get loose. I am acquainted with a circular machine that has been in use for twenty-five years, and the whole cost, including the machine and all repairs during the time, has not exceeded an average of fifty cents a year.

MARKETING BUTTER.

Butter is disposed of in various ways. Some practice selling to speculators in the country for what they can get; others take it to the principal markets themselves; a third class send it to commission merchants in the markets; and still another class get several dairies together and send it by an individual in whom they have confidence, and he will sell it on commission. The latter is one of the best ways of marketing butter. Such an individual, by going year after year, will become acquainted with the market, and is thus prepared to realize the best prices. Butter made in the spring, on hay, should be packed in tubs or half firkins and sent to market as fast as made. There is a class of dairymen that continue to send in their butter fresh every week through the season, but this class is confined to those that are so situated as to have better facilities for marketing than the majority.

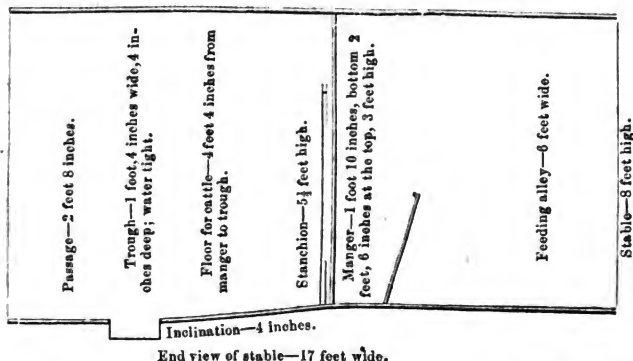
COW STABLES.

It is necessary for the cows that they should be provided with good, warm, well ventilated stables. These should be so made as to keep the cows dry and comfortable, and made convenient for feeding and milking the cows when in the stable. Gates are objectionable. It is almost impossible to keep cows clean when confined by them, and they are very inconvenient about milking. Various kinds of fastenings are employed by using chains, ropes or straps, but all have their objections. Stanchions are the most used and give the best satisfaction.

The greatest objection made to stanchions is that they confine the cattle too closely; but experience has proved that this objection is not as serious as is supposed by many, as cattle do well when they are used.

The following is the dimensions of a stable designed for medium sized cows:

Whole width of stable, including feeding alley, seventeen feet. The alley should be six feet wide. The manger should be one foot ten inches wide at the bottom, two feet six inches at the top, and three feet high in front of the cows. The stanchions will occupy two inches. The floor should be four feet four inches in the clear, with an inclination of four inches from stanchion to trough. The trough made water tight, sixteen inches wide and four inches deep, and floor back of trough, two feet eight inches wide. The width of stalls should be three feet and four inches, or eighteen stalls in sixty feet.



Some would recommend to have the passage behind the cows, eight feet wide, so that a team could pass along, and the manure loaded up, and taken directly to the field, and save once handling over; but the necessity of getting up a team every time the stables are cleaned, and the extra expense of making the building so much wider, would about offset all that was gained. A team could be used in the stable described, when the cows were out, by driving so as to have one sled runner on each side of the trough. The feeding alley is made six feet wide, to be convenient for storing roots, to be fed before cold weather. An alley five feet wide would answer for feeding hay.

The stable should have a row of studs through the center, eight feet six inches in the clear, from the back side, and three feet four inches apart. Lay down a sound two inch plank, one foot eight inches wide, the edge two and a half from the back side, through the whole length of the stable, for the bottom of the trough. Place around the edge of this plank, cotton wick, covered with pitch, and spike strips of plank, two inches square, on the edge, and lay the floor with two inch plank, so as to come out even with the inside of these strips, over the whole of the stable. This will leave the trough four inches deep. Nail on the bottom of the studs, boards fourteen inches wide for the back side of the manger; and those eight inches wide, five feet from the floor, in the clear, for the top of stanchions.

The stanchions should be good hard wood, plump inch thick, five and a half feet long—the stationary one nine inches wide, and the movable one tapering from nine inches at one end, down to five at the other. Put up the stanchions seven inches apart, in the clear, for the neck. Notch down the back of the manger, for the neck, within six inches of the floor. Boards, six inches wide, should be pinned on top and bottom, through the whole length, to keep the stanchions to their place, and the movable one held to its place by a dog. The manger boarded up in front, and between the cows, so that each one can be fed by itself.

Stanchions made in this way will answer a good purpose, and cost much less than those made by framing timbers top and bottom.

ROOT CELLARS.

Convenient to the feeding alley should be a good root cellar, where roots can be kept through the winter without freezing. Where a new stable is to be built, it would be best to include the cellar within or under the stable; but when the buildings are built without a place to store roots, one can be made independent in the following manner: Excavate the dirt the same as for any cellar, of sufficient size to hold all the roots designed to be fed. Build a drain under the wall all around to carry off the water that would be likely to run into it. The walls should be laid up dry eight feet and a half high, faced on both sides three feet from the top, and twenty inches thick. Eighteen inches below the top of the wall, lay sleepers of durable timber for a floor. Point the wall outside and in, down as far as it is faced on the outside. On this wall erect any building wanted on the farm, either a hen, tool or corn-house, and fill up the space between the floors with chaff. The entrance to the cellar, made through an outside door. Bank up the wall within a foot of the top on the outside. If no building is needed put on plates and cover with a roof. Where the cellar is made on a side hill, or against a bank, it would be best to bank it up on three sides, and the wall on the lower side should be pointed with lime mortar down to the ground, and two doors made to prevent freezing, one to be hung on the outside of the wall, and the other on the inside.

MANURE.

The management of manure is a question of importance to every farmer. How can the manure of the farm be increased, not only in quantity, but in quality also, and how it should be applied to the soil so as to produce the best crops and be the greatest benefit to the land, are important questions. The object of having a water tight trough is to save the liquid droppings of the stable, which can be done by providing a cistern to receive it. Where no cistern is used, the next best way is to use every absorbent at hand to retain it. By mixing the liquid and solid droppings of the stable in the trough, the solid will take up a large portion of the liquid and retain it, and with the addition of muck, mould, leaves, straw, sawdust or anything of the kind, the whole of it may be saved. The stock of the farm should be kept in the stable or yard from the time that grass begins to fail in the fall, until feed is good in the spring. By adopting this plan a large addition to the manure heap will be made, and the meadows and pastures

will be preserved from injury by being trodden up when soft, and the grass roots will not be exposed to injury by having their covering gnawed off. The yard should be supplied with water for stock, even if it is expensive to accomplish it. The dairyman can make a large quantity of valuable manure from the hog pen.

The hog pen should be of good size; or, say sixteen feet square, for five. Make a basin, or cistern, by the side of the pen of good dimensions, that will hold water. By digging into the hard-pan it will answer; or, if the ground is sandy, pound in clay to make it hold. Build the floor of the pen tight, and so all of the drippings will run into the cistern. Make a floor of rails over the cistern, to receive the manure pile. Keep the hogs in the pen the year round, and keep the whole floor of the pen covered with straw, leaves, weeds or litter of any kind, at least a foot thick. As fast as the bed, or any part of it is wet, it should be thrown out on the pile. The whole pile should be thoroughly wet from the cistern, every two or three days. This can be most conveniently done with the aid of a pump. Hogs fed on dairy slop will require a large amount of litter to keep the bed dry, and it is surprising to see what an amount of valuable manure can be made by following up the directions above, thoroughly, in the course of the year. The whole mass will soon rot, and be of more value than any other heap of its size made on the farm.

Night soil should be composted with four or five times its bulk of chip dirt. At least one load of manure can be collected from each cow in the milking yard, by throwing it up into piles every two or three days, through the summer. The advantage in having the yard clean and in good order will pay for this labor, and the manure will be clear gain.

ROOTS.

A root cellar will be of little use, unless roots are raised to put in it. Some prefer to raise one kind for feeding, and some another. Turnips, ruta bagas, carrots, beets &c., can be successfully and profitably raised in this country. Root crops are among the most profitable crops that the dairyman can raise; but this is not realized as it should be among them. Some practice raising roots on the same piece of ground, year after year. There is at least two objections to such a practice. One is, other parts of the farm are sacrificed to keep one part manured; and another is, it will cost more to raise the crop, owing to weeds growing much more readily where the ground is cultivated every year. Take sod ground, and turn it over early, by the first of September, and the sod will have time to rot before cold weather. In the fall and winter, as fast as the manure accumulates at the stables, draw it on to the plowed ground, and pile it in heaps of ten loads each. The manure should be taken from the different stables and mixed; say one part horse manure, one part from hog pen, and three parts from cow stable. That from the trough in the cow stable, is of a cold nature, and full of liquid. This, mixed with that from the horse stable and hog pen, which is of a dryer and warmer nature, especially the first, will be a benefit to both, by increasing the heat and decomposition in the one, and preventing an excess in the other. The piles should be built up square

and snug, and, if possible, covered with muck, sods, or anything of the kind. In the spring, when the ground is in good order to work, spread the manure over the ground evenly, and make it fine by bushing and dragging, and then mix it with the soil, by plowing, dragging and bushing. This work should be continued until the ground is made fine and light. The best practice of applying manure to cultivated crops, I conceive to be to mix it thoroughly with the soil, but never to spread it on grass ground and turn it under, to remain there until after the crop is raised. For ruta bagas, ridge the ground twenty-eight inches apart. Brush the ridges lengthwise. This will make the dirt on the ridges fine, to receive the seed. The last of May, or the first of June, drill in the seed, at the rate of one pound per acre. Where no drill can be had, a cup, with an awl hole in the bottom, will answer the purpose to sow the seed, and cover with a rake. Unquestionably, for a field crop, the ruta бага of the purple top variety, is the best. As soon as the plants are up, and the third leaf appears, thin them out, leaving the plants one foot apart, and but one in a place. This will look like a war of extermination, but the good of the crop will require it. After thinning, plaster the plants, at the rate of one bushel per acre. Should insects trouble the plants, sow on ashes. Cultivate between the rows with a shovel plow, weeder and small cultivator, and keep the crop clean from weeds by hoeing.

No weeds should be allowed to go to seed. Plaster the second time after the leaves are some size. Much will depend upon the attention and labor bestowed upon the crop. Where the ground is kept clean and stirred often, the turnips will grow much larger.

The harvesting should not be put off too late in the fall, for what is lost in the roots will be gained in the tops; and the roots can be cleaned more readily than after the late rains. Gather, by cutting off the tops with a hoe, and pull the roots with a hook, and knock off the dirt. After they have dried, if the turnips are large, take one in each hand, thump them together, and throw them into the wagon. Where the roots are small, it would be better to use the basket. Cultivating with a horse, lessens the expense of raising the crop very much. For carrots, the rows should be about fifteen inches apart, and the plants every three or four inches in the row. Sow them earlier in the season than ruta bagas.

FEEDING COWS.

There is no stock on the farm that pays better to feed well than milch cows. After a cow comes in in the spring, she should not be allowed to shrink in her milk for want of a sufficient quantity of good nutritious food. The time that they should come in depends upon how they are to be fed; but it is always best to have them come in while fed on hay, before they are turned to grass. After they go to grass they are more liable to caked bag, milk fever, and other diseases, and many cows are lost. Where they are supplied with good hay and roots, or grain, the first of March is the time to have them begin to give milk. Spring butter then usually commands the highest

price. Feed about eight quarts of ruta bagas or carrots, per day, to each cow after milking, with a liberal supply of the best hay on the farm. Feed regular, at least, three times a day. Roots are much more profitable to raise, to feed cows, than grain. From eight to twelve, and even fifteen hundred bushels of ruta bagas can be raised on an acre, at a cost of from four to seven cents per bushel; and when butter is worth twenty-five cents per pound, they are worth about twenty cents per bushel to feed to cows. Nearly as many carrots can be raised at a cost of from seven to ten cents per bushel, and are worth nearly thirty cents. Some object to feeding ruta bagas, and contend that good butter cannot be made when they are fed. If improperly fed, and in unreasonable quantities this is the case. Feed four quarts at a time, *after each milking*, and salt the cows often, and better butter can be made than from hay, without the root. Corn fodder should be raised and fed, when the pasture fails in the summer or fall. Cows are left, many times, to live on the pasture, in the fall, when they should have corn fodder or root tops. The tops, of an acre of good ruta bagas, are worth as much as the hay from the same amount of ground. A root slicer, made with a knife one foot four inches long, put in a gate made to play before a hopper, with the bottom inclining and sides diverging towards the knife, and a board put on the gate, below the knife, to gauge the thickness that the roots are to be cut, is found to be as efficient as many that are sold at agricultural warehouses.

SOURD MILK.

The soured milk of the dairy is an article of some importance, and it should be disposed of so as to bring in the largest income. Under ordinary circumstances it is best to feed it to hogs. Feed the cows well through the winter, and they will feed the pigs. The pigs should have a warm bed, and when the milk fails, carrots are much cheaper to winter them on than corn. Keep them growing through the winter, and have them in good thriving order in the spring—and give them what milk they want through the summer to drink—and they will answer to butcher in the fall when the milk begins to fail, without any other feed. Pork, made from dairy slop, is but little, if any, inferior to that made on corn, and is made at much less cost. But few that use pork, can tell whether it was fattened on corn or milk, after the hog is cut up. After the hogs are butchered, what is to be done with them? Is it best to sell them as they are, or pack them? We will see what is best to be done. Assuming that pork is worth \$7 per hundred, in the hog, and \$19 per barrel—hams will bring 12½ cents, shoulders, 10 cents, and lard, 12½ cents. Every ten pounds of pork packed, will weigh out eleven after it is salted. Hams and shoulders will fall short after they are smoked, about one-eighth. Cut up the hog in the following manner. Split the hog through the back bone, take out the lard, cut off the head, cut out the hams and shoulders, and cut the side meat into strips, the way the ribs run through the back bone. One hundred and eighty-five pounds of the side meat will make a barrel of mess pork, and will weigh out, after it is salted, over two hundred pounds. Dissolve salt-

peter, and bathe the hams and shoulders, and rub on all the fine salt that will stick to them, and keep them covered with salt two weeks. If large, they will want to lay three weeks. Wash off the salt and smoke. The coarse meat will be the legs, head and the rib, on the inside of the shoulder. At the prices named, we will see what four hogs, weighing fifteen hundred, will come to.

5 bbls. pork, 185 lbs. each,	925 lbs., at \$19 per bbl.,	.....	\$95 00
100 lbs. lard, less 5 lbs.,	95 lbs., at 12½ cts. per lb.,	....	11 87
200 do ham, less ½,	175 do 12½ do	....	21 88
144 do shoulders, less ½,	126 do 10 do	....	12 60
131 do coarse meat, at 2½,	.....		3 27
			<hr/>
			\$144 62
Less five packing barrels, at \$1.12,	.....		\$5 62
Less four bushels salt and saltpeter,	.....		3 50
			<hr/>
			9 12
			<hr/>
Value of 1,500 lbs. pork, packed,	.....		\$135 50
do 1,500 lbs. sold, at \$7,	.....		105 00
			<hr/>
Profit for packing,	.....		\$30 50
			<hr/>

The value of the pork, at these prices, is nine cents per lb. after it is packed.

GENERAL REMARKS.

Many farmers, and far too many, have given up trying to raise their bread, long since, and depend upon buying flour from the west. With good manure, good tillage, and good seed, farmers can better afford to raise wheat for bread, even in unfavorable localities, than to depend upon buying. We have heard the remark from farmers, that their land was more natural to oats than wheat, and they could raise oats and sell, to buy their wheat, easier than to raise it. The same men are apt to complain, after oating their land pretty well, that the grass seed did not catch, and they could not get a sod on the ground; when the fact is the land is too much reduced to produce any thing but weeds. There is no danger of injuring the farm by raising oats, if they are fed out, and the manure is put back on the land. When butter is worth twenty-five cents per pound, it will pay to feed oats to cows, if they are not worth over fifty cents, and corn, if it is not worth over one dollar; but it will pay better to raise and feed roots, and especially if fed with hay. We are acquainted with farmers that have not failed of raising a fair crop of wheat, but once in thirty years, and this too, in a very unfavorable locality. The ground must be clean from seeds, where wheat is sown, as it will let any thing grow with it, and give place for it. Oats or buckwheat will shade out other plants that come up, better than wheat.

It is a mistaken idea to plow up meadow ground, when the grass begins to fail, unless it is made better by manuring. The best meadows of the country are those, generally, that have been plowed the least. When the grass begins to fail, top dress with fine rotted manure, in the fall, and plaster in the spring.

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LANDS.

In the Transactions for 1858, p. 202 to 225, we gave the first part of the report of experiments made by J. B. Lawes, F. R. S., F. C. S., and Dr. J. H. Gilbert, F. C. S., with different manures on permanent meadow land, from the 19th volume of the Journal of the Royal Agricultural Society of England. The approbation which this valuable series of experiments has given, has induced us to give the second and third parts of the series of experiments made by the same gentlemen, and published in the twentieth volume of the Journal of the Royal Agricultural Society, p. 228.

The experiments contained in these reports are of immense value, and if carefully studied, as we trust they will be, by many of our farmers and dairymen, will lead to a great increase of valuable grasses, and a great saving in manure, by the right application of manures best adapted to accomplish the object desired. Messrs. Lawes & Gilbert are entitled to the thanks of the agriculturists of our country, as well as those of Great Britain and Europe, for these valuable experiments in a direction so important, and hitherto never before undertaken. The character of these gentlemen, as to their peculiar fitness for this work, was alluded to in our last volume, and we congratulated them on the success of their efforts to aid the agriculturists in this most important and hitherto neglected portion of their labor, the proper culture of meadow grasses. We trust these gentlemen will be spared to continue their experiments as they propose to do, in the fourth series of experiments, when the "*percentage composition*" of the complex produce, *hay*, will be considered. When this is done, we shall have a work which will lead every intelligent farmer, who interests himself in it, to an increase of his hay crop that will more than double the yield of valuable grasses; and, in a still greater proportion, diminish the useless and injurious leguminous plants which now are permitted to infest our fields.

B. P. J.

REPORT OF EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.

BY J. B. LAWES, F. R. S., F. C. S., AND DR. J. H. GILBERT, F. C. S.

PARTS II. AND III.

[Continued from Vol. 18, Trans., p. 225.]

PART II.—*Produce of Constituents, per acre.*

In order that the more directly practical conclusions to be drawn from the experiments might be brought out more prominently, attention was confined, in the former section of our report, almost exclusively to the nature of the manures employed, and to the amounts of the gross produce,

or increase, of hay obtained by their use. A few passing remarks, only, were made upon the variable character of the herbage, according to the description of manure employed. But there are other aspects of the subject than those hitherto considered, which are well worthy the attention of the intelligent farmer.

The permanent meadow land of a farm stands in a somewhat isolated position, in regard to the crops under tillage. In the case of the *rotation* crops, the straw of the corn ones, the larger portion of the most important manurial constituents of the green crops, frequently the manure from the consumption of the hay of the meadow land itself, and perhaps that from imported cattle-food also, will, at least once in the course, find their way to the arable land. But the meadow land does not generally come in for a due share of restoration of constituents, by the home manures. Hence it happens, that the amount of constituents actually carried from the land, year by year, in the hay crop, has generally a more direct influence on exhaustion than that harvested in the rotation produce.

It is important to consider, then, what amounts of the several constituents are taken from an acre of land in an ordinary crop of hay? what is the drain of them which the stores of the soil, or the supplies of other manures, are called upon to meet, when the produce is increased by means of active portable manures? and further, what is the proportion of the active manurial constituent *nitrogen*, supplied in such manures, that is recovered in the increase of crop obtained by its use?

It is also essential, to a right appreciation of the action of different manures upon the grass crop, carefully to ascertain their influence upon the development of the different plants of which the mixed herbage is made up, and at the same time to take into consideration the recognized comparative qualities of the different plants so developed.

Lastly, with a great variation in the proportion of the different plants developed, and in the degree of their maturity at any given time, according to season and the manure employed, it is obvious that there must be corresponding variation in the percentage composition of the complex produce, *hay*. The influence of the different manures upon the *chemical composition of the hay* constitutes, therefore, another important point of inquiry.

It would, perhaps, in some points of view, be more in order to give the results of the analyses, and with them to consider the *percentage* composition of the hay, before treating of the *acreage* yield of the several constituents, calculated by means of those results; but it will upon the whole, be more convenient to complete the subject of the *quantity* of produce before commencing upon that of *quality*.

• Having, therefore, in Part I, considered the acreage amounts of the *gross produce* or *hay*, attention will be directed in the present section (Part II,) to the acreage quantities of certain *constituents*, or *classes of constituents*, obtained by the different manures.

Part III will be devoted to the discussion of one element of quality,

namely, that of the description and proportion of the different plants developed.

Lastly, in Part IV, the *percentage composition* of the complex produce, hay, will be considered.

The particulars relating to the amount of the several constituents, per acre, contained in the produce by the different manures, are given in a series of tables as follows :

In Table III.—The produce of hay, per acre, calculated in lbs., as the basis of the succeeding tables.

In Table IV.—The produce of total *dry substance*, per acre, in lbs.

In Table V.—The *mineral matter* (ash), per acre, in lbs.

In Table VI.—The *nitrogen* in the *total produce*, per acre, in lbs.

In Table VII.—The *nitrogen* in the *increase by manure*, per acre, in lbs.

In Table VIII.—The *proportion* of the *nitrogen recovered in increase*, for 100 parts supplied in manure.

1. THE DRY MATTER PER ACRE.

On the amounts of *dry matter*, per acre (Table IV), a very few observations will suffice. Taking the average of the three years over which the experiments extended, the annual yield of dry matter was, *without manure*, almost exactly a ton per acre. This is slightly under the amount obtained, without manure, in *wheat* (corn and straw together), taking the average of fourteen years of the consecutive growth on the same land ; and it is several hundred weight below that obtained in *barley*, without manure, taking the average of six years' consecutive growth on the same land.

By means of *manures*, the yield of dry matter, per acre, in the hay crop, was in several of the experiments considerably more than doubled. The increased produce of dry matter was thus great, indeed the greatest, where no carbonaceous manure whatever was employed. It may be reckoned that the dry substance of the hay would contain about 40 per cent of carbon. Adopting this estimate, there would be about 900 lbs. of carbon assimilated per acre, in the average annual produce of the unmanured land. Where an enormous amount of organic matter, rich in carbon, was supplied in the form of sawdust, little or no increased assimilation of carbon took place ; where a still larger quantity was employed in the form of farm-yard manure (in admixture, therefore, with other active manurial matters,) there was a considerable increase in the assimilation of carbon. But, under these circumstances, it is doubtful whether the farm yard manure itself was the source of the increased amount of carbon fixed, or at any rate, whether its supply of that substance (in the form of carbonic acid or otherwise) has been at all essential.

Thus it was by means of mixtures of mineral manures and ammoniacal salts, without the direct supply of any carbon, that the greatest increased assimilation of that substance was obtained. For instance, on plots 10 and 13, there was an average of about $1\frac{1}{2}$ tons of increased dry substance per

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.
TABLE III.—PRODUCE OF HAY PER ACRE, LBS.

Plot Nos.	MANURES. (Per acre, per annum.)	ANNUAL PRODUCE.				Average annual increase by manure.
		1856	1857	1858	Average of 3 years.	
1	Unmanured	2,515	2,856	2,472	2,614	.....
2	Unmanured (duplicate plot)	2,351	2,592	3,860	2,768	.....
	Mean or standard unmanured	2,433	2,724	2,916	2,691	.....
3	2,000 lbs. sawdust	2,312	2,340	2,244	2,299	392
4	200 lbs. each, sulphate and muriate ammonia	4,028	3,774	3,282	3,929	1,237
5	200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust	3,953	3,710	4,166	3,943	1,232
6	275 lbs. nitrate of soda	.....	.....	2,952	.....	261
7	550 lbs. nitrate of soda	.....	.....	3,564	.....	873
	SERIES 2.—With direct mineral manure.					
8	Mixed mineral manure	3,429	3,666	4,082	3,726	1,035
9	Mixed mineral manure, and 2,000 lbs. sawdust	3,711	3,994	4,376	4,027	1,336
10	Mixed mineral manure, and 200 lbs. each, sulphate and muriate ammonia	6,363	6,422	7,172	6,652	3,961
11	Mixed mineral manure, and 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust	6,369	6,428	6,892	6,563	3,872
12	Mixed mineral manure, 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. cut wheat straw	5,412	6,050	6,752	6,071	3,380
13	Mixed mineral manure, and 400 lbs. each, sulphate and muriate ammonia	6,970	6,940	7,908	7,139	4,448
14	Mixed mineral manure, and 275 lbs. nitrate of soda	.....	.....	4,236	.....	1,545
15	Mixed mineral manure, and 550 lbs. nitrate of soda	.....	.....	5,646	.....	2,955
	SERIES 3.—With farm yard manure.					
16	14 tons farm yard manure	4,030	5,328	4,164	4,507	1,816
17	14 tons farm yard manure, and 100 lbs. each, sulphate and muriate ammonia	5,009	6,008	5,320	5,445	2,755

* For full description of the "Mixed mineral manure," see part I, of Trans., vol. 18, p. 206.

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.

TABLE IV.—PRODUCE OF TOTAL DRY SUBSTANCE PER ACRE, LBS.

Plot Nos.	MANURES. (Per acre, per annum.)	ANNUAL PRODUCE.				Average annual increase by manure.
		1856	1857	1858	Average of 3 years.	
SERIES 1.—Without direct mineral manure.						
1	Unmanured.....	2,061½	2,431½	2,124½	2,205½	.....
2	Unmanured (duplicate plot).....	1,885½	2,202½	2,872	2,340	.....
Mean, or standard unmanured.....						
3	2,000 lbs. sawdust.....	1,973½	2,347½	2,498½	2,273½	.....
4	4200 lbs. each, sulphate and muriate ammonia.....	1,866½	2,052½	1,893½	1,937½	335½
5	5200 lbs. each, sulphate and muriate ammonia.....	3,222½	3,272½	3,348	3,280½	1,007½
6	6275 lbs. nitrate of soda.....	3,148½	3,251½	3,496	3,298½	1,025½
7	7550 lbs. nitrate of soda.....	.....	.....	2,503	.....	230
8	Mixed mineral manure.....	.....	.....	3,059½	.....	786½
SERIES 2.—With direct mineral manure.						
9	Mixed mineral manure.....	2,751½	3,179½	3,493½	3,141½	868½
10	Mixed mineral manure, and 2,000 lbs. sawdust.....	2,987½	3,406½	3,679½	3,377½	1,104½
11	Mixed mineral manure, and 200 lbs. each, sulphate and muriate ammonia.....	5,024½	5,591½	5,889½	5,561½	3,228½
12	Mixed mineral manure, and 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust.....	4,924½	5,606½	5,778	5,436½	3,163½
13	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. cut wheat straw.....	4,296½	5,249½	5,562½	5,033½	2,760½
14	Mixed mineral manure, and 400 lbs. each, sulphate and muriate ammonia.....	5,445	5,967	6,057	5,823	3,550
15	Mixed mineral manure, and 275 lbs. nitrate of soda.....	.....	.....	3,666½	.....	1,387½
16	Mixed mineral manure, and 550 lbs. nitrate of soda.....	.....	.....	4,811½	.....	2,538½
SERIES 3.—With farmyard manure.						
17	10 14 tons farm yard manure.....	3,068½	4,652½	3,521	3,747½	1,474½
18	17 14 tons farm yard manure, and 100 lbs. each, sulphate and muriate ammonia.....	3,985½	5,181½	4,400½	4,522½	2,249½

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.
TABLE V.—PRODUCE OF TOTAL MINERAL MATTER (ASH) PER ACRE, LBS.

Plot Nos.	MANURES. (Per acre, per annum.)	ANNUAL PRODUCE.				Average annual increase by manure.
		1856	1857	1858	Average of 3 years.	
SERIES 1.—Without direct mineral manure.						
1	Unmanured	157.4	160.7	141.0	153.1	.....
2	Unmanured (duplicate plot)	156.1	148.0	186.8	163.7	.....
Mean, or standard unmanured						
3	2,000 lbs. sawdust	156.8	154.4	163.9	158.4	.....
4	2,000 lbs. sawdust	153.0	132.0	113.8	132.9	25.4
5	4,200 lbs. each, sulphate and muriate ammonia	239.4	206.8	204.5	223.6	65.2
6	5,200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust	237.5	206.5	222.1	222.0	63.6
7	6,275 lbs. nitrate of soda, .....	.....	.....	169.1	.....	10.7
8	7,550 lbs. nitrate of soda .....	.....	.....	191.7	.....	33.3
SERIES 2.—With direct mineral manure.						
9	Mixed mineral manure	237.4	225.8	264.5	242.6	84.2
10	Mixed mineral manure, and 2,000 lbs. sawdust	271.3	263.4	283.2	272.6	114.2
11	Mixed mineral manure, and 200 lbs. each, sulphate and muriate ammonia	431.2	403.3	468.5	434.3	275.9
12	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust	447.9	412.4	468.7	443.0	264.6
13	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. cut wheat straw	364.1	394.9	451.2	403.4	245.0
14	Mixed mineral manure, and 400 lbs. each, sulphate and muriate ammonia	457.9	445.5	476.6	460.0	301.6
15	Mixed mineral manure, and 275 lbs. nitrate of soda, .....	.....	.....	271.1	.....	112.7
16	Mixed mineral manure, and 550 lbs. nitrate of soda .....	.....	.....	368.1	.....	209.7
SERIES 3.—With farmyard manure.						
17	14 tons farmyard manure	293.9	346.7	279.8	306.8	149.4
18	17 1/4 tons farmyard manure, and 100 lbs. each, sulphate and muriate ammonia	376.5	397.6	368.4	374.2	215.8

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LANDS.

TABLE VI.—PRODUCE OF NITROGEN PER ACRE, LBS.

Plot Nos.	MANURES. (Per acre, per annum.)	ANNUAL PRODUCE.				Average annual increase by manure.
		1856	1857	1858	Average of 3 yrs.	
* SERIES 1.—Without direct mineral manure.						
1	Unmanured	42.2	36.8	34.6	37.9	.....
2	Unmanured (duplicate plot)	42.1	38.1	45.0	41.7	.....
Mean, or standard unmanured.....						
3	2,000 lbs. sawdust	42.2	37.4	39.8	39.8	.....
4	200 lbs. each, sulphate and muriate ammonia.....	38.6	32.3	31.6	34.2	5.6
5	500 lbs. each, sulphate and muriate ammonia.....	63.2	58.5	65.7	62.5	22.7
6	2,000 lbs. sawdust	62.8	55.3	65.0	61.0	21.2
7	6275 lbs. nitrate of soda.....	.....	.....	49.6	.....	0.8
8	7550 lbs. nitrate of soda.....	.....	.....	60.9	.....	21.1
SERIES 2.—With direct mineral manure.						
9	Mixed mineral manure	57.3	55.4	57.1	56.6	16.8
10	Mixed mineral manure, and 2,000 lbs. sawdust.....	65.7	59.1	60.8	61.9	22.1
11	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia.....	78.3	75.8	89.6	81.2	41.2
12	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust	80.2	71.3	80.6	77.4	37.6
13	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia, and 2 lbs. cut wheat straw	79.5	80.8	91.1	83.8	44.0
14	Mixed mineral manure, and 400 lbs. each, sulphate and muriate ammonia.....	103.8	112.4	128.4	114.9	75.1
15	Mixed mineral manure, and 275 lbs. nitrate of soda.....	.....	.....	64.4	.....	24.6
16	Mixed mineral manure, and 550 lbs. nitrate of soda.....	.....	.....	74.5	.....	34.7
SERIES 3.—With farm yard manure.						
16	14 tons farm yard manure	54.4	69.8	49.1	57.8	18.0
17	14 tons farm yard manure, and 100 lbs. each, sulphate and muriate ammonia	81.1	64.9	67.6	71.2	31.4

EXPERIMENT WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.

TABLE VII.—NITROGEN PER ACRE, IN INCREASE, WHERE A KNOWN QUANTITY WAS SUPPLIED IN MANURE, LBS.

Plot No.	MANURES. (Per acre, per annum.)	Increase over the produce without manure.				Increase over the produce by the mixed mineral manure.			
		Average of 3 yrs.				Average of 3 yrs.			
		1856	1857	1858	Average of 3 yrs.	1856	1857	1858	Average of 3 yrs.
SERIES 1.—Without direct mineral manure.									
4	200 lbs. each, sulphate and muriate ammonia.....	21.1	21.0	25.9	22.7				
5	200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust.....	20.7	17.8	25.3	21.3				
6	275 lbs. nitrate of soda.....			9.8					
7	550 lbs. nitrate of soda.....			21.1					
SERIES 2.—With direct mineral manure.									
10	Mixed mineral manure, and 200 lbs. each, sulphate and muriate ammonia.....	36.1	38.3	49.8	41.4	21.0	20.4	32.5	24.6
11	Mixed mineral manure, and 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust.....	36.1	33.9	40.8	37.6	23.0	16.0	23.5	20.8
12	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. cut wheat straw.....	37.4	43.4	51.3	44.0	22.3	25.5	34.0	27.3
13	Mixed mineral manure, and 400 lbs. each, sulphate and muriate ammonia.....	61.7	75.0	88.6	75.1	46.6	57.1	71.2	58.3
14	Mixed mineral manure, and 275 lbs. nitrate of soda.....			24.6				7.3	
15	Mixed mineral manure, and 550 lbs. nitrate of soda.....			34.7				17.4	
SERIES 3.—With farmyard manure.*									
17	14 tons farmyard manure, and 100 lbs. each, sulphate and muriate ammonia*.....	20.7	4.9	18.4	13.4				

* The increase is here taken over the produce by farm yard manure alone.

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.
TABLE VIII.—NITROGEN RECOVERED, AND NOT RECOVERED, IN INCREASE, FOR 100 SUPPLIED IN MANURE.

Plot numbers.	MANURES. (Per acre, per annum.)	INCREASE TAKEN OVER THE PRODUCE WITHOUT MANURE.				INCREASE TAKEN OVER THE PRODUCE BY THE MIXED MINERAL MANURE.			
		Per cent of supplied nitrogen recovered in increase.				Per cent of supplied nitrogen recovered in increase.			
		Average of 3 yrs.				Average of 3 yrs.			
		1856	1857	1858	AV. per ct. of supplied nitro. in increase.	1856	1857	1858	AV. per ct. of supplied nitro. in increase.
SERIES 1.—Without direct mineral manure.									
4	200 lbs. each, sulphate and muriate ammonia	25.7	25.7	31.6	27.7	72.3			
5	200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust	23.9	20.6	29.1	24.5	75.5			
6	275 lbs. nitrate of soda			23.8					
7	550 lbs. nitrate of soda			25.8					
	Mean	24.8	23.1	.....	26.1	73.9			
SERIES 2.—With direct mineral manure.									
10	Mixed mineral manure, and 200 lbs. each, sulphate and muriate ammonia	44.0	46.7	60.8	50.5	49.5	25.6	24.9	30.0
11	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. sawdust	44.0	39.2	47.2	43.5	56.5	26.6	18.5	24.1
12	Mixed mineral manure, 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. cut wheat straw	39.5	45.8	54.2	46.5	53.5	23.6	26.9	35.9
13	Mixed mineral manure, and 400 lbs. each, sulphate and muriate ammonia	37.6	45.7	51.0	45.8	54.2	29.4	34.8	43.4
14	Mixed mineral manure, and 275 lbs. nitrate of soda			59.9					17.7
15	Mixed mineral manure, and 550 lbs. nitrate of soda			42.3					21.2
	Mean	41.3	44.4	54.0	46.6	53.4	26.0	26.3	36.5
SERIES 3.—With farm yard manure.									
17	14 tons farm yard manure, and 100 lbs. each, sulphate and muriate ammonia*	65.2	12.0	44.9	32.7	67.3			

* The increase is here taken over the produce by farm yard manure alone.

* The increase is here taken over the produce by farm yard manure alone.

acre, per annum, by the use of the mixed mineral manure and ammoniacal salts. This amount of gross dry increase, represents an increase assimilation of carbon, by about 12 cwt. per acre, per annum, without the supply of any in the manure. To this enormous extent, therefore, have these *non-carbon* yielding manures enabled the plants, either by their roots or their leaves, to draw that element, so essential for the maintenance of the respiration, and for the fattening of our animals from the atmosphere, into which, in the course of the ever constant revolutions of organic nature, it had been emitted by the combustion or decomposition of the products of former vegetation, or by the respiration of animals fed on former crops, and into which, it is destined to be returned by the same means, as the resource of future vegetable growth.

It was seen how unavailing were *mineral manures alone* materially to increase the growth of the *graminaceous* hay plants. That is to say, by their supply alone, these plants were not enabled to assimilate an increased amount of either nitrogen or carbon from natural sources. Nor did the supply of one of these elements—*carbon*—enable the plants to draw from natural sources, an increased amount of the other element—*nitrogen*. On the other hand, provided there was a sufficiency of the necessary mineral constituents, the supply of the element—*nitrogen*, in an available form of combination, increased, enormously, the assimilation of the atmospheric constituent—*carbon*. It may be remarked in passing, that a very similar result is observed when nitrogenous manures are employed for the *graminaceous crops of our rotations*. Not that no other crops as found to assimilate an increased amount of carbon, without its supply in manure, when they have a sufficiency of mineral constituents and available nitrogen within the soil. But compared with others, the *graminaceous* crops appear to be the most strikingly independent of any artificial carbonaceous supply.

2. THE MINERAL MATTER PER ACRE.

The average annual yield, per acre, of *mineral matter* (Table V,) was, in the unmanured *hay crop*. 158½ lbs. This, it may be observed, is about one and a half times as much as was contained in the annual *unmanured* produce of either *wheat* or *barley*.

By the use of *ammoniacal salts alone*, an average of 223½ lbs., or about two cwt. of mineral matter, was annually taken from the land in the *hay crop*. This, again, is from one and one-third to one and a half times as much as was removed in either *wheat* or *barley*, when similarly manured; that is, by *ammoniacal salts alone*. By the *addition of mineral manures to the same amount of ammoniacal salts*, the quantity of mineral matter annually taken off the land in the *hay crop*, was increased to nearly four hundred weight per acre. Against this amount, *farm yard manure* gave an average of only 306¾ lbs. of mineral matter in its annual yield of *hay*, notwithstanding that it itself contained, not only a very large amount of mineral constituents, but of *nitrogen*, also, which is so essential to bring them into play. This comparatively defective action of the constituents of *farm yard manure* is, doubtless, owing, in great measure, to the slow libe-

ration of both the nitrogen and the mineral matter supplied in that form. When *ammoniacal salts* were used, in addition to the farm yard manure, still, only, 374½ lbs. of mineral matter were annually taken from the land—that is to say, still considerably less than when the whole of both the nitrogen and the mineral matter were provided in a more readily available condition.

It is more particularly in *potash** that the hay crop is more exhausting than what might be called a corresponding produce of either wheat or barley. In relation to this point, attention should be called to the fact that, as practice goes, almost as a matter of course, a notable proportion of the phosphoric acid, and of the magnesia, almost the whole of the silica, and by far the larger proportion of both the lime and the potash, taken from the land in the *wheat* and the *barley* crops, will, at some period of the rotation, be returned to it, in the home manures to which the straw of these crops has contributed. But in the case of meadow land, associated with land under tillage, it is by no means so probable, that the mineral constituents of the hay will, in anything like a corresponding degree, find their way back from whence they came. It will be obvious, therefore, that, according to current practice, the meadow land will be much more liable than the arable to become deficient in a due provision of the necessary mineral constituents. These considerations show that both the wheat and the barley crops may, with comparative impunity, be kept up to a high point of productiveness, by means of forcing portable manures, provided only, that the crops of the course, as a whole, receive their due share of the home manures. It will, at the same time, be equally obvious, that similar means are not applicable for the production of full crops of hay, unless similar conditions be provided; that is to say, unless the meadow, in its turn, received a due proportion of the home manures.

Where, however, grass is grown for hay, by those holding little or no arable land, it is generally for the supply of a neighboring town; and in such cases a liberal amount of stable and other town manures, is generally brought upon the land. Under these circumstances, the additional use of the more active portable manures, will not, as a rule, be advantageous.

3. THE NITROGEN PER ACRE.

Attention must now be directed, to the acreage yield in the hay of the important constituent *nitrogen*. In the experiments under consideration, the annual yield of nitrogen per acre, taking the average result of three years, was, *without manure*, 39.8 lbs. (see Table VI.) By the side of this amount it may be mentioned, that the average of fourteen consecutive years of *unmanured wheat*, gave 30.7 lbs; and that of six consecutive years of *unmanured barley*, 26.5 lbs. of nitrogen.

*Independently of the fact that an ordinary hay crop will contain more mineral matter than the corn and the straw of an ordinary wheat or barley crop, the ash of the hay contains about twice as high a percentage of *potash* as that of the gross produce (corn and straw), of *wheat* or *barley*. But further particulars will be given regarding the *individual mineral constituents* of the hay crop, in Part IV, of our paper.

From these figures it appears that the hay crop (so far as the experiment has yet extended) has given from one-third to one-half more nitrogen per acre per annum, without manure, than either wheat or barley. Part of this excess of nitrogen in the hay crop, though probably not the whole of it, is due to the fact that the *mixed herbage*, of the hay comprised a number of *leguminous* plants, which contain a higher percentage of nitrogen, and have, apparently, greater powers of assimilating it from natural sources, than the *graminaceous* ones. Indeed, where mineral manures alone were employed (plot eight), under the influence of which the development of *leguminous* plants was greater than on any of the other plots, there was an average of 56.6 pounds per acre per annum of nitrogen, without the supply of it in manure, instead of only 39.8 pounds without manure of any kind. Thus, without the addition of any nitrogenous manures, there was here an average annual increase of 16.8 pounds of nitrogen per acre. But this increased yield of nitrogen obtained by the use of mineral manures, it is to be observed, was not due to an increased development of the *graminaceous* but to that of the *leguminous* portion of the herbage. In fact, the annual yield of nitrogen per acre in this case, where the *leguminous* plants comparatively so much predominated, was nearly double that which has been obtained in the continuously unmanured cereal crops of the arable land.

The next point of consideration in regard to the *nitrogen statistics* of the *hay crop*, is one of great interest, both in a practical and scientific point of view; namely, that of the relation of the nitrogen in the *increase*, to that in the *manure* employed to produce it. Tables VII. and VIII. illustrate this part of the subject. Table VII. shows the *actual increase* of nitrogen in the produce (in pounds per acre), where it was supplied in manure. Table VIII. shows the proportion of nitrogen recovered in the increase for 100 of it supplied in the manure. But in both tables two sets of columns are given. The first of these relates to the increase of nitrogen over that in the *unmanured* produce, and the second to the increase over that in the produce by the *mixed "mineral manures."* The reader has thus the facts put before him in two aspects. It appears to us, however, from a careful consideration of all the circumstances of the experiments, that the only legitimate mode of estimating the amount, or proportion, of nitrogen recovered in the increase of hay for a given amount of it supplied in the manure, will be to assume the nitrogen of the *unmanured*, and not that of the *mineral manured produce*, as the standard or normal yield, upon which to calculate the increase obtained by the action of nitrogenous manures, whether this be used alone, or in addition to mineral manures.

Thus, it must be remembered, that the increase, both of gross produce and of nitrogen, was, when *mineral manures alone* were employed, due to an increased development of *leguminous* plants. On the other hand, when nitrogenous manures were used, either alone or in combination with mineral manures, the increase was due to the increased development of the *gra-*

minaceous herbage only. Under these circumstances, it is obvious that the whole increase by the combined action of both nitrogenous and mineral manures (it being almost entirely graminaceous) must be supposed to be due, so far as the resources of nitrogen are concerned, to that artificially supplied in the manure. That is to say, bearing in mind the difference in the description and composition of the herbage grown by mineral manures alone, and by mineral manures in admixture with nitrogenous ones, the influence of the addition of the nitrogen is not represented simply by the difference between the prominently *leguminous* produce by mineral manures alone, and the almost exclusively *graminaceous* produce, when nitrogenous as well as mineral manures are employed. It will be obviously much nearer the truth, to assume that the artificially supplied nitrogen—whether employed alone or in conjunction with mineral manures—was engaged in the production of at least the whole amount of increase above the produce without manure.

In fact, it is not impossible that, in even this mode of estimate, the degree in which the artificially supplied nitrogen has been involved in the amount and composition of the produce, is somewhat understated. For, even the *unmanured* produce contained more of the highly nitrogenized *leguminous* herbage, than did that grown by either ammoniacal salts alone, or by ammoniacal salts in conjunction with mineral manure. Hence, it might be concluded, that the point beyond which the artificially supplied nitrogen became involved in the production of *graminaceous* increase, would be even below that represented by the acreage yield of nitrogen without manure. For, that amount depended materially upon the quantity of the highly *leguminous* herbage in the unmanured produce, which was at once diminished on the addition of nitrogenous manures.

For the above reasons, then, it is assumed that at least the whole of the nitrogen in the produce by *nitrogenous* manures beyond that yielded on the *unmanured* plot, may be calculated as due, in a certain sense, to that which was artificially supplied, whether or not the nitrogen was so supplied alone, or was aided in its action by conjunction with mineral manures. At the same time, it is freely granted that the legitimacy of any estimates regarding the proportion of the nitrogen supplied by manure which is involved in the increase obtained by its use, must rest entirely on that of the assumption made as to the amount of the whole nitrogen of the produce, which is to be attributed to natural sources. It is not, indeed, possible to obtain actual proof that produce grown by nitrogenous manures has really assimilated *neither more nor less* of nitrogen from other sources, than that grown without them. It might be supposed, that with a ready supply of available nitrogen within a limited range of the soil, the plants would draw less upon the natural or unaided resources. On the other hand, it might be assumed, that with the increased vigor of growth due to nitrogenous manure, the feeders of the plant would be so extended, both above and under ground, as to increase its command over the natural resources of available nitrogen. It is obvious, therefore, that the best estimate to

which our judgment can lead, cannot, after all, be looked upon as representing with certainty, the exact proportions in which the nitrogen of the manured produce has, in point of fact, been obtained from the natural and artificial sources, respectively. These observations will sufficiently indicate the degree of reservation with which the figures in the Tables, and the arguments founded upon them, should be accepted.

In regard to the figures in Table VII, which show in lbs. the *actual increase of nitrogen per acre by its use in manure*, it should be explained, that, where 400 lbs. of ammoniacal salts, or 550 lbs. of nitrate of soda, were employed, per acre, it is estimated that 82 lbs. of nitrogen were thereby supplied. The 275 lbs. of nitrate of soda is, of course, assumed to supply half, and the 800 lbs. of ammoniacal salts double that amount. The 2000 lbs. of sawdust, according to direct analysis, would contain only four and one-half lbs. of nitrogen. It is, then, to these amounts of nitrogen *supplied*, that those recorded in the table as *increase*, are to be respectively referred.

But it is in Table VIII, where the *increase of nitrogen in the produce* is, for each experiment, calculated in relation to 100 parts of it supplied in manure, that the *proportion* of the nitrogen assumed to be recovered, to that supplied, is brought to view the most clearly.

Where ammoniacal salts were used alone (see upper division of Table VIII), there was, taking the average of the three years, only 27.7 per cent of the supplied nitrogen recovered in the increase. And where the ammoniacal salts and sawdust were used, there was somewhat less still recovered, namely, 24.5 per cent.

The nitrate of soda, which was employed in one season only, and then sown somewhat disadvantageously late, when it was used alone, returned in the increase of produce, nearly the same proportion of its nitrogen as the ammoniacal salts (as just quoted), namely, 23.8 per cent, when the smaller amount, and 25.8 when the larger amount of the salt was used. But in reference to this result, it should be mentioned, that the *percentage* of nitrogen in the hay grown by the nitrate, was notably higher than in that grown by the ammoniacal salts in the same season; in fact, the proportion of nitrogen in the former was somewhat abnormally high.

The result was, then, that where either ammoniacal salts or nitrate of soda were employed without the aid of the mineral manure, there was only about *one-fourth* of the supplied nitrogen recovered in the immediate increase of the hay crop.

In connexion with the result just above stated, attention may be called to the fact, that if, where both mineral and nitrogenous manures are employed (see lower division of Table VIII), the increase of nitrogen in the produce by the use of it in manure is supposed to be represented by *so much only* as was over and above that yielded by the *mineral manures alone*, there would then appear to be only about the same proportion of the supplied nitrogen recovered, as when the nitrogenous manures were used alone, and the increase of nitrogen then calculated over that in the

unmanured crop. Thus, taking, as supposed, the yield of nitrogen by the *mineral manures alone* as the basis of the calculation, the increase obtained by the super-addition of the 400 lbs. of ammoniacal salts, will have returned only 30 per cent; that by the 400 lbs. of ammoniacal salts, and 2000 lbs. of sawdust, only 24.1 per cent; that by the 400 lbs. of ammoniacal salts and 2000 lbs. cut wheat straw, only 28.8 per cent, and that by the 800 lbs. of ammoniacal salts; 35.5 per cent of the supplied nitrogen. In regard to the fact, that there appears to be a larger proportion of the supplied nitrogen recovered (35.5 per cent) when the extravagant amount of 800 lbs. of ammoniacal salts per acre was employed, it may be stated that the result is due to an extremely *high percentage* of nitrogen in the produce, and not to a favorable proportion of increase. The larger return of the supplied nitrogen is, therefore, though an apparent, yet only a questionable advantage. Adopting the same mode of calculation as above, the addition of nitrate of soda to the mineral manures gave a less favorable result than that of ammoniacal salts. When 41 lbs. of nitrogen were employed in the form of nitrate, there were only 17.7 per cent, and when 82 lbs. of nitrogen were so provided, there were only 21.2 per cent of the supplied nitrogen recovered in the increase.

But, reckoning, as has been shown it would be more proper to do, that the whole of the nitrogen obtained by the conjoint action of the mineral and nitrogenous manures *beyond that yielded without manure*, has probably been due to that artificially supplied, the proportional return in the immediate increase then appears to be much greater. On this mode of estimation, the 400 lbs. of ammoniacal salts (with mineral manure) have returned in the increase 50.5 per cent; the 400 lbs. of ammoniacal salts; and 2000 lbs. of sawdust (with mineral manure) 43.5 per cent; the 400 lbs. of ammoniacal salts and 2000 lbs. of cut wheat straw (with mineral manure) 46.5 per cent; the 800 lbs. of ammoniacal salts (with mineral manure) 45.8 per cent; the 275 lbs. of nitrate of soda (with mineral manures) 59.9 per cent; and the 550 lbs. of nitrate of soda (with mineral manure) 42.3 per cent of the nitrogen supplied in the manure.

Taking the average of the results just quoted, there were about 48 per cent of the supplied nitrogen recovered in the immediate increase of the hay crop, when the nitrogenous manure was associated with a liberal provision of the necessary mineral constituents. Such at any rate is the result, on the assumption that as much of the nitrogen of the produce as was *in excess of that obtained without manure*, is to be attributed to that which was *artificially supplied*. When, however, the same nitrogenous manures were employed without the aid of mineral manures, only about half as much of the supplied nitrogen appeared to be recovered in the immediate increase. There was, moreover, little more than half as much of the supplied nitrogen estimated as recovered, if, when mineral and nitrogenous manures were used together, the yield of nitrogen by the *mineral manures alone*, instead of that *without manure*, were assumed to represent the amount obtained from natural sources. But, even though the *larger* amount may more nearly represent the actual proportion of the

supplied nitrogen which was recovered in the increase when mineral manures were also used, it will be, at the same time, obvious that, in a certain *practical sense*, the only gain of nitrogen in produce by the addition of it to the mineral manures, is that amount beyond what would have been obtained by the mineral manures alone.

On other occasions it has been shown, that, in the growth of full crops, of either *wheat* or *barley*, by the direct application of nitrogenous manures, little more than forty per cent of the supplied nitrogen could be estimated, as recovered in the immediate increase obtained. It might, perhaps, be anticipated that the result would be different in the case of the *hay crop*. Not only are but few of the plants composing it fully ripe at the time of being cut, but their roots have a much more complete possession of the whole area of the superficial layers of soil. So far as the experiments have yet extended, the *hay crop* does not appear to return in its immediate increase, a larger proportion of the supplied nitrogen compared with *wheat* or *barley*, than might, perhaps, with reason, be attributed to the more extended distribution of the feeders of the crop on a given area of land.

It appears, then, from the evidence as yet at command, that in the case of the *grass crop*, as in that of the *ripened cereal grains*, a considerable proportion of the expensive constituent, *nitrogen*, which may be supplied in manure, has to be reckoned as *unrecovered*, in either the immediate or the closely succeeding increase of crop.

The possible explanations of this loss of nitrogen, real or apparent as the case may be, are numerous; but they are more or less within the reach of careful and extended experimental inquiry. It may be supposed that a portion of the unrecovered amount of nitrogen is, in some form, drained away and lost—that the supplied nitrogenous compound is transformed in the soil, and nitrogen in some form evaporated; that a portion remains in the soil in some fixed and unavailable state of combination; that ammonia, or some other compound of nitrogen, or free nitrogen itself, is given off during the growth of the plant; or, it may be, that the range of distribution of the supplied nitrogen, and its state of combination within the soil, are alone sufficient obstacles to its being taken up in larger proportion by the immediate crop. Should the last supposition afford a sufficient explanation of the facts observed, the assumed loss would be one but in appearance merely. The farmer might then still hope to reap the whole benefit of his costly nitrogenous manures, in the course of time, in succeeding crops. Be this as it may, the facts that have been recorded afford additional confirmation of the opinion so frequently insisted upon, that, in the case of the *graminaceous* plants which we cultivate, a full crop is obtained only when there is a liberal provision of *available nitrogen within the soil*; and further, that when this provision is made by means of direct nitrogenous manures, a large proportion of the so supplied nitrogen will remain unrecovered in the increase of crop, at least for a considerable period of time.

The main facts elicited on a consideration of the *acreage yield* in the *hay crop*, of some of its important *constituents* or *classes* of *constituents*, according to the condition of manuring, may be summed up as follows :

1. The average annual produce of *total dry substance*, in the *unmanured meadow hay crop*, was about one ton per acre, which would contain about 900 lbs. of carbon. These amounts are somewhat less than were annually obtained *without manure* in either *wheat* or *barley*.

2. *Purely carbonaceous manures* did not appear to increase the assimilation by the *graminaceous* herbage of either carbon or nitrogen.

3. *Purely mineral manures* induced little or no increased assimilation of either *carbon* or *nitrogen*, by the *graminaceous*, but a considerable amount by the *leguminous* herbage.

4. *Specially nitrogenous manures*, such as ammoniacal salts, even when used alone, notably increased the assimilation of *carbon* and *nitrogen* by the *graminaceous*, but not by the *leguminous* herbage.

5. By means of manure supplying *both mineral constituents* and *nitrogen*, but no carbon, there was an annual increase of *graminaceous* produce, equal to about one and a half tons of *dry substance* per acre, which would contain about twelve hundred weight of carbon.

6. The annual yield of *mineral constituents* in the *unmanured hay crop*, was nearly one and a half hundred weight. This amount is about one and a half times as much as was contained in either *wheat* or *barley* when *unmanured*.

7. By means of *mineral manure alone*, or *ammoniacal salts alone*, the annual yield of mineral matter in the *hay crop* was raised to about two hundred weight per acre; and by mineral and nitrogenous manure combined, to about four hundred weight per acre.

8. It is particularly in *potash* that the *hay crop* is more exhaustive of soil constituents, than either *wheat* or *barley*.

9. Owing to the comparatively large amount of *mineral constituents*, taken from the land in the *hay crop*, to the less regular return of them by the *home manures*, and to the less exposure of the soil in the case of *meadow land*, more special attention is required to prevent *its* practical exhaustion of soil constituents, than in the case of arable rotation land.

10. The annual yield of nitrogen, per acre, was, in the *unmanured hay crop*, nearly forty pounds. This is from one-third to one-half more than was annually obtained in unmanured wheat or barley.

11. The hay grown by *mineral manures alone*, yielded considerably more nitrogen per acre than that grown *without manure*. The increased amount was due to an increased growth of the *leguminous*, and not of the *graminaceous* herbage.

12. *Nitrogenous manures alone* (ammoniacal salts and nitrate of soda) gave an increase of nitrogen in the produce equal to only about one-fourth of that supplied in the manure.

13. *Mineral and nitrogenous manures combined* gave an increased produce of nitrogen equal to from forty-five to fifty per cent of the nitrogen
[AG. TRANS.]

supplied in the manure. Wheat and barley, under similar circumstances, gave an increased produce of nitrogen equal to rather more than forty per cent of that supplied in the manure. The rather more favorable result with the *hay crop* is not more than is probably attributable to the more complete distribution of the under-ground feeders of the crop.

14. In the case of the *meadow grasses*, as in that of the *graminaceous plants grown in rotation*, the growth was much increased by *direct nitrogenous manures*; and, in both cases, from fifty to sixty per cent of the *supplied nitrogen* remained *unrecovered* in either the immediate, or the closely succeeding increase of crop.

PART III.—*Description of Plants developed by different Manures.*

Perhaps the most remarkable and interesting of the effects of the different descriptions of manure, upon the complex herbage of which the experimental meadow was composed, was the very varying degree in which they respectively developed the different kinds of plants.

Allusion has already frequently been made, in a cursory way, to the greater development of the *leguminous* herbage by purely *mineral manures*, and to that of the *graminaceous* plants, or natural grasses commonly so called, by characteristically *nitrogenous manures*. In fact, the plots had each so distinctive a character in regard to the prevalence of different plants, that the experimental ground looked almost as much as if it were devoted to trials with different seeds as with different manures. So striking and characteristic, indeed, were the effects produced in this respect, that, in 1857 and 1858, the subject was thought to be of sufficient interest to induce us to request the examination of the plots by Professor Henfrey, to which he kindly assented.

An endeavor was also made in the second year, 1857, to separate and determine the proportion of the different plants in carefully averaged and weighed samples, taken from the several plots as soon as the grass was cut. Taking advantage of the experience gained in this first trial, the separations have been carried out more carefully in the case of the produce on some of the most important plots in the third season, 1858. The results of these separations are recorded in detail in Table IX., page 133, and in a summary form in Table X., page 137; and it is the consideration of those results that will constitute the subject of this third part of our report.

The mode of proceeding in making the separations and estimations, may be shortly explained. As soon as the grass on a plot was cut down, samples were taken from many parts of it. These were carefully intermixed in such manner as to shake out as little seed as possible; and then, from the whole, a certain quantity was weighed out to be further operated upon. Characteristic specimens of each of the plants *in flower or seed*, or in other conditions in which they could be recognized, were then selected as types; and a number of boys were set to pick from the weighed sample, all they could find to correspond with these types. The remainder con-

sisted chiefly of *detached foliage, and undeveloped stems*, which was then separated into four or five different lots, according to types selected, to the best of our judgment. Each weighed sample was thus divided into from fifteen to twenty different descriptions of herbage. The weight of each of the selected portions was afterwards taken—all in an equal condition of dryness. The weights so obtained, of the respective grasses or other plants, or parts of plants, in the original weighed sample from the plot, were then calculated into their percentage relation to the collective weight of the whole of the separated portions in their partially dried state. It is the results so obtained that are recorded in the Tables. It should be mentioned that we are indebted to Dr. Evan Pugh, of Pennsylvania, for the superintendence of the botanical part of the inquiry.

It will be obvious that absolute exactness in the determination of the proportions in which the different plants really occurred on the respective plots, would be extremely difficult to attain. If the bulk of the sample taken were so large as to exclude all possible doubt of its being a fair average of the whole produce, the labor of the separations would be so great as to be almost impracticable. There is, however, no doubt that the Tables do, in the main, very closely represent the facts. They do so, at any rate, quite sufficiently to bring very strikingly to view the most characteristic and important distinctions that were observed to be developed.

In the respective columns of the Table of detail (IX.) are given :

1. The botanical names of the plants.
2. The common, or English names.
3. The *percentage proportions* of each plant, &c., on some of the most important of the experimental plots.

4. Notes taken on a comparative examination of the specimens.

The plots selected for the botanical analysis of their produce were :

Plot 1.—Unmanured.

Plot 4.—With ammoniacal salts alone.

Plot 8.—With the “mixed mineral manure”^{*} alone.

Plot 10.—With the “mixed mineral manure,” and ammoniacal salts.

Plot 13.—With the “mixed mineral manure,” and the double quantity of ammoniacal salts.

Plot 16.—With farm-yard manure.

Plot 17.—With farm-yard manure and ammoniacal salts.

The separated plants are classified into,

1st. Graminaceous herbage (grasses commonly so called), in culm, bearing flower or seed.

2d. Graminaceous herbage, detached leaf and undeveloped stem.

3d. Leguminous herbage.

4th. Miscellaneous herbage, chiefly weeds.

Within each of these classes, the plants are enumerated in the table, *in the order in which they respectively occurred in the largest proportion*

^{*} For full description of the “mixed mineral manure,” see part 1 of this paper, Vol. XVIII of Trans. p. 212.

on the *unmanured plot*, The comparison of the figures in the column relating to any particular *manured plot*, with those relating to the *unmanured*, thus shows at once, the deviation from the standard result which is induced by the manure in question, both as regards the *order* as to quantity, and the actual *numerical proportion*, in which the different descriptions of herbage were found to be developed.

In addition to the above explanation, it will be an useful further preliminary to the discussion of the effects of the different manures, to make a few remarks on the general character of the herbage of the experimental meadow.

In the third season (1858), to which our table of separations refers, there was no *Dactylis glomerata* (Rough Cock's-foot), no *Poa Pratensis* (Smooth-stalked Meadow-grass), no *Bromus mollis* (Soft Brome-grass), and no *Avena Pratensis* (Meadow Oat-grass), detected in the produce of the *unmanured plot*. The Rough Cock's-foot and Smooth-stalked Meadow-grass occurred, however, on some of the manured plots; and each in large proportion under certain conditions of manuring. But the Soft Brome-grass, and Meadow Oat-grass, occurred in very few cases at all, and then in very small quantity. There was too, a striking absence, on all the plots, of several esteemed permanent meadow grasses. Thus *Alopecurus pratensis* (Meadow Foxtail); *Festuca Pratense* (Meadow Fescue); *F. duriuscula* (Hard Fescue); *Phleum pratense* (Meadow Cat's-tail); and *Poa trivialis* (Rough-stalked meadow-grass), were not found in our list at all in the third season, 1858. The Meadow Fox-tail, the Meadow Cat's-tail, and a Fescue-grass were, however, each observed on one or more of the plots in 1857.

Attention may now be directed to the comparative development of each of the plants according to the manure employed, taking each *seriatim*, in the order in which it predominated on the unmanured land. A short statement of the reputed characters of each, as to its adaptation to local conditions, and as to its recognized agricultural value, will, at the same time be given.* The comparative development of the different *graminaeous* plants will be first considered. The records relating to these are given in the two upper divisions of the table (IX); those in the first refer to the plants in *culm*, and those in the second to the *leafy and indeterminate Graminaeous produce*.

* See on these points Lawson's "Synopsis of Vegetable Products," &c.; Bravander's "Prize Report," Journal of the Royal Agricultural Society of England, Vol V, part II; Professor Buckman's Papers, Journal of the Royal Agricultural Society of England, Vol. XV, p. 462 Vol. XVII, p. 162, and Vol. XVII, p. 513; "Donaldson on Manures and Grasses," and Morton's "Cyclopædia of Agriculture."

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.

TABLE IX.—*Showing the description and proportions of the different kinds of herbage developed, according to the manure employed. 3d season, 1858.*

1.—GRAMINACEOUS HERBAGE, STEMS BEARING FLOWER OR SEED.

DESCRIPTION OF THE HERB- AGE.		PERCENTAGE AMOUNTS OF EACH PLANT, &c.								NOTES.	ORDER OF LUXURIANCE.	ORDER OF RIPENESS.	GENERAL CONDI- TION.
		Artificial manures.				Farm yard manure.							
BOTANICAL NAMES.	COMMON NAMES.	Unmanured.		Mixed mineral ma- nure.		Mixed mineral ma- nure, and ammoni- acal salts.		Mixed min. man. & double quantity ammoniacal salts.		Alone.	With ammoniacal salts.		
		Plot 1. 16.77	Plot 4. 14.73	Plot 8. 23.39	Plot 10. 32.23	Plot 13. 12.10	Plot 16. 14.92	Plot 17. 10.16	Plots. 1, 4, 10, 16, 17, 8, 13;	Plots 8 & 4; 1, 13 and 16, nearly ripe; 17, unevenly ripe; 10, rather green	On all plots more or less shedded, remaining seeds not ripe. Rather green; little difference; 10 and 13 affected by bulk & laying.	On every plot two distinct grades of ripeness; some dead ripe, some green.	All dead ripe, chiefly shedded.
Lolium perenne ..	Common rye grass	14.02	14.43	6.94	32.64	26.37	10.75	19.87	10, 16, 17, 8, 13; 1, 4	Plots 8 & 4; 1, 13 and 16, nearly ripe; 17, unevenly ripe; 10, rather green	On all plots more or less shedded, remaining seeds not ripe. Rather green; little difference; 10 and 13 affected by bulk & laying.	On every plot two distinct grades of ripeness; some dead ripe, some green.	All dead ripe, chiefly shedded.
Holcus lanatus ..	Woolly soft grass, or Yorkshire fog	6.04	3.27	9.07	4.84	2.56	14.33	17.16	17, 16, 17, 16, 10, 1, 8, 4; 13	Plots 8; 16 and 17 nearly ripe; 4 and 1 greenish; 10 and 13, green	Rather green; little difference; 10 and 13 affected by bulk & laying.	On every plot two distinct grades of ripeness; some dead ripe, some green.	All dead ripe, chiefly shedded.
Arrhenatherum avenaceum	Fibrous-rooted, tall oat-like grass	5.43	0.41	1.01	0.09	0.34	0.66	1, 8, 4; 10, 16, 17	Plots 17, dead ripe; 8, 4 and 10, ripe; 1, mostly ripe; 16, nearly ripe	Plots 4, ripe; 1 and 8, pretty ripe, 17, part dead ripe; 13, nearly ripe; 10 and 16, part ripe	On every plot two distinct grades of ripeness; some dead ripe, some green.	All dead ripe, chiefly shedded.	
Anthoxanthum odoratum	Sweet-scented vernal grass...	4.82	0.97	0.03	1.48	2.16	.....	1.25	1, 10, 13; 17, 4, 8	Plots 10, dead ripe; 8 and 4, ripe; 13 unevenly ripe; 17 greenish; 1 green			
Agrostis vulgaris,	Common or creep- ing-rooted bent grass, also black switch, &c												

2.—GRAMINACEOUS HERBAGE, DETACHED LEAVES AND INDETERMINATE STEMS.

Leafy produce—from woolly soft grass	3.41	12.28	5.46	4.06	15.35	2.24	5.55
Coarse leaf, &c.—some bent grass, probably also cocksfoot, soft brome, grass and others	8.78	11.46	1.79	0.64	3.93	3.58	1.32
Middling leaf—chiefly bent grass, some meadow oat-grass, &c.	3.41	8.18	14.33	4.43	.....	4.03	.....
Fine leaf, &c.—unknown; possibly some <i>festuca bromoides</i> , or barren fescue-grass	7.81	16.37	5.82	2.58	1.18	4.48	4.22
Dead leaves and stems	2.44	4.91	2.24	7.01	11.81	3.58	3.96
Total	25.85	53.20	29.64	24.72	32.27	17.91	15.05

3.—LEGUMINOUS HERBAGE.

<i>Lathyrus pratensis</i>	2.07	2.20	4.53	.....	2.02	1.32	Plots 8, 1, 4, 16, 17	Plot 1, little seeded; 4, no ripe seed; 16, in flower; 8 and 17, green and in flower
<i>Lotus corniculatus</i>	1.83	.....	0.45	.....	.....	.....	Plots 1, 8	Plot 8, in flower; 1, chiefly in flower, green
<i>Trifolium pratense perenne</i> ...	1.22	.....	17.91	.....	1.68	0.46	Plots 8, 16, 1, 17.	Plots 1, 17, scarcely ripe; 8, in full head; 16, some flowers, greenish.
	5.12	2.20	22.89	.....	3.70	1.78		Green; chiefly in bloom; turning.

4.—MISCELLANEOUS HERBAGE, CHIEFLY WEEDS.

<i>Plantago lanceolata</i>	10.79	0.41	.....	0.09	.....	1.96	8.25	Plots 17, 1, 16, 4, 10	{ Plot 4, pretty ripe; 10 & 17, nearly ripe; 16, 1, full head, not ripe ...
<i>Carum carui</i>	1.71	.....	0.78	0.28	.....	1.62	1.72	Plots 16, 17, 1, 8, 10	Plots 17, 1, seed shedding; 8, 10, 16, ripe
<i>Achillea millefolium</i>	1.34	3.58	0.48	0.28	0.59	0.22	1.78	Plots 4, 17, 1, 8, 10, 13, 16	Plots 13, 1, 16, not in flower; 8, 10, greenish; 4, 17, green

• With some *Agrostis*.† With some *T. repens* on plot 8.

TABLE IX.—(Continued.)

DESCRIPTION OF THE HERB- AGE.		PERCENTAGE AMOUNTS OF EACH PLANT, &c.									NOTES.	
		Artificial manures.						Farm yard manure.				
		Unmanured.	Ammoniacal salts alone.	Mixed mineral ma- nure.	Mixed mineral ma- nure and ammo- niacal salts.	Mixed min. manure & double quantity ammoniacal salts.	Alone.	With ammoniacal salts.				
BOTANICAL NAMES.	COMMON NAMES.	Plot 1.	Plot 4.	Plot 8.	Plot 10.	Plot 13.	Plot 16.	Plot 17.	ORDER OF LUXURIANCE.	ORDER OF RIPENESS.	GENERAL CONDI- TION.	
Rumex acetosa ..	Sheep's sorrel or dock.....	0.67	1.02	0.23	0.88	1.08	1.12	3.10	Plots 17, 10, 13, 16, 1, 4, 8	Plots 1, 8, 16, nearly ripe; 4, 17, some seeded; 10, 13, green	Some in bloom; some with ripe seeds. Ripe.	
Silene	Catchfly	0.61	.....	.....	.....	.....	.....	.....	.....	Ripe .....	.....
Ranunculus*	Crowfoot.....	0.49	1.13	.....	.....	.....	2.02	1.58	Plots 16, 17, 4, 1	Plot 17, seed ripe; 16, in seed; 1, in seed, leaves green; 4 flowers and seed	Stems bearing ripe seed, but having green rad- ical leaves. Ripe.
Lasula campestris	Field wood-rush.	0.12	.....	.....	.....	.....	.....	.....	.....	Ripe; seeded.....	.....
Veronica chamae- drys	Germanderspeed- well .....	.....	.....	0.22	.....	.....	0.11	.....	Plots 8, 16.....	Plots 8, 16, in flower	In flower.
Galium verum...	Common yellow- flowered bed- straw, or cheese rennet .....	.....	.....	.....	0.32	.....	.....	.....	.....	.....	Not yet in flower.
Total .....	.....	15.73	6.14	1.71	1.85	1.67	7.05	16.43	.....	.....	.....

* Various species

TABLE X.—Summary of the facts given in more detail in Table IX.

	PERCENTAGE AMOUNTS OF EACH PLANT, &c.							
	Unmanured.	Artificial manures.					Farm-yard manure.	
		Ammoniacal salts alone.	Mixed mineral manure.	Mixed mineral manure and ammoniacal salts.	Mixed mineral manure and double quantity ammoniacal salts.		Alone.	With ammoniacal salts.
	plot 1	plot 4	plot 8	plot 10	plot 13	plot 16	plot 17	
Total grasses in flower or seed	50.25	35.91	42.18	72.66	65.08	69.76	64.62	
Total grasses in condition of detached leaves and indeterminate stems	25.85	53.20	29.64	24.72	32.27	17.91	15.05	
Total graminaceous herbage.....	76.10	89.11	71.82	97.38	97.35	87.67	79.67	
Total leguminous herbage	5.12	2.20	22.89	.....	.....	3.70	1.78	
Total miscellaneous herbage (chiefly weeds)	15.73	6.14	1.71	1.85	1.67	7.05	16.43	
	96.95	97.45	96.42	99.23	99.02	98.42	97.88	
Shedded seeds, &c., &c.	3.05	2.55	3.58	0.77	0.98	1.58	2.12	
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

I.—GRAMINACEOUS HERBAGE.

1. *Lolium perenne*. Common rye grass.

This grass is reputed to be suitable to a great variety of soils, but to vary very much in character, according to external conditions. It is easily propagated, is luxuriant and succulent, and yields an earlier feed than most other grasses. It is relished by stock, yields good hay, and is, in fact, one of the most generally useful of grasses. It flowers in June and July. The grass having these reputed characters stands at the head of the list as to quantity *in culm*, not only on the unmanured plot, but on several of the others also. What proportion of the *detached leaf and undeveloped stem*, on the different plots, belonged to this grass, we were not able to determine. In the condition of flowering or seeding stem, the produce, without manure, contained 16.8 per cent of it; that by purely mineral manures, 23.4 per cent; that by ammoniacal salts alone, 14.7 per cent; that by the "mixed mineral manure" and 400 pounds ammoniacal salts, 32.2 per cent; and that by the "mixed mineral manure" and 800 pounds of ammoniacal salts, only 12.1 per cent of it. Against these proportions of flowering and seeding *Lolium*, on the unmanured and artificially manured plots, the produce by the farm-yard manure contained 29 per cent of it; and that by the farm-yard manure and ammoniacal salts, only 14.9 per cent.

The general result in regard to the amount of rye-grass in flowering and seeding stem, according to manure, is as follows: The proportion of it in the total produce was considerably increased by the "mixed mineral ma-

nures" alone, by the "mixed mineral manures" and the smaller amount of ammoniacal salts, and by the farm-yard manure alone. On the other hand, its proportion was diminished whenever the ammoniacal salts were used in relative excess; that is, when the ammoniacal salts were used alone, when they were used (with the mineral manures) in double quantity, and when they were employed in addition to the farm-yard manure. When the ammoniacal salts were used *alone*, the proportion of *graminaceous leaf and undeveloped stem* was very high; when those salts were used in *excessive* amount with the mineral manures, the proportion of *two other grasses* (the woolly soft grass and the rough cock's foot) predominated over that of the rye grass; and when the ammoniacal salts were used in addition to farm-yard manure, *three other plants* (woolly soft grass, tall oat like grass and smooth-stalked meadow grass) seemed to gain upon the rye grass in degree of luxuriance.

Before passing to the next plant on the list, a few remarks may be appropriately made which have a bearing, not only on the interpretation of the results just given, but on that of those which have to follow. It must not be supposed that figures which represent the proportion of *flowering and seeding stem* of a certain plant, at one given period of the season, are, at the same time, accurate indications of the relative development of the total plant under the conditions in question. It must be borne in mind, that the numerous plants which constitute the complex herbage of our meadows, have each their natural period of flowering and seeding. This period will, however, be accelerated or postponed, as the case may be, by the external circumstances of soil, season, manure, and the association with other plants. General observation shows that *nitrogenous* manures have a characteristic tendency to increase the development of *leaves and shoots* in our graminaceous herbage. *Mineral* manures, on the other hand, induce much more the *seeding tendency*. With full supplies of mineral manures, therefore, we should expect (other conditions being favorable) that there would be a larger proportion of the growing plant in culm, at a given period, than when ammonia was supplied in relative excess. The general result was, indeed, that the proportion of the total graminaceous plants which was *in culm*, was the greater where the mineral supplies predominated, and the proportion in leaf and undeveloped stem the greater when ammoniacal salts predominated. Hence the effect of a manure on the development of the *total plant*, cannot be determined unconditionally by the proportion found in flowering and seeding stem.

The evidence is, nevertheless, sufficiently clear, that the bulky, luxuriant, and generally useful *rye-grass*, was considerably developed by high artificial manuring, when this supplied a sufficiency of mineral constituents, and a pretty full, but not excessive amount of nitrogen. But when ammoniacal salts were used in addition to farm yard manure, the proportion of the rye-grass appeared to be diminished. It will be afterwards seen that this result was due to the fact, that two other grasses (tall oat-like grass, and smooth-stalked meadow-grass,) which occurred either in comparatively

small proportion or not at all, on the other plots, were very considerably developed by the farm-yard manure.

2. *Holcus lanatus*. Woolly Soft-Grass or Yorkshire Fog.

This grass is said to be natural to damp and peaty soils; to give a considerable amount of after-math, but not to be liked by cattle either when green or in hay, being too soft, spongy, and insipid. In fact, some consider it as almost a weed. It is further said, to usurp the land in sandy soils, not to be reduced by cultivation, and to have the tendency to banish the artificial grasses. It flowers in July.

Such are the characters of the grass which was found second in amount among those in *culm*, on the unmanured land. It occurred, however, in larger proportion still on some of the manured plots. A considerable proportion of the *leafy* produce was also referred to this plant. The woolly soft-grass, in the condition of flowering and seeding stem, constituted fourteen per cent of the produce without manure, 6.9 per cent of that by mineral manures alone; 14.4 per cent of that by ammoniacal salts alone; 32.6 per cent of that by the mineral manures; and 400 lbs. per acre of ammoniacal salts; and 26.4 per cent of that by the mineral manures and the 800 lbs. of ammoniacal salts. Lastly, in the produce by farm-yard manure alone, the proportion was only 10.7 per cent., and in that by farm-yard manure and ammoniacal salts, 19.9 per cent.

The general result was, that the proportion of the woolly soft grass was very much increased by nitrogenous manures. The effect was the more apparent when the leafy portion of the produce attributed to this plant was taken into the calculation. In fact, it is those artificial manures which developed the largest proportions of *total graminaceous herbage*, that yielded the largest amounts of this grass. It amounted, culm and leaf together, to more than a quarter of the total produce when ammoniacal salts were used alone, to nearly forty per cent of it when the mineral manures and the 400 lbs. of ammoniacal salts were employed, and to more than forty per cent of the total produce when the mineral manures and the 800 lbs. of ammoniacal salts were used. The proportion of the whole which was in the condition of leaf and undeveloped stem, was much the greatest where the ammoniacal salts were in relative excess; that is to say, when those salts were either used *alone* or in the *double quantity with the mineral manures*. Where farm-yard manure was employed, the woolly soft-grass, like the rye-grass, as mentioned above, appeared to be somewhat displaced in its proportion by the predominance of two other grasses (oat-like grass, and smooth-stalked meadow grass), to which further reference will be made presently. Still, by the addition of ammoniacal salts, even to farm-yard manure, the proportion of the woolly soft-grass was considerably increased.

This woolly soft-grass, and the rye-grass together, constituted about one-third of the total produce without manure; they together made up more than two-thirds of that by the mineral manures and the smaller amount of

ammoniacal salts ; and more than half of that by the mineral manures and double amount of ammoniacal salts.* Upon the whole, it appears that, although the rye-grass is much increased by nitrogenous manures, the woolly soft-grass is even more characteristically so ; the latter, at the same time, seems less dependent on a coincidentally liberal supply of mineral constituents. So far, therefore, as the relative development of these two plants is concerned, the character of the herbage would be the better when the supply of nitrogen, in the manure, was not excessive, and that of mineral constituents liberal.

It is quite consistent with the character given to the woolly soft-grass, namely : that it tends to usurp the land, and is not reduced by cultivation ; that the manures which give the greatest increase in the produce of hay should give so large a proportion of this ill-reputed element. If, indeed, this grass be really so objectionable as it has been stated to be, it would appear to be very desirable, carefully to exclude it from the seed in laying down grass land ; otherwise, soil and other circumstances being adapted to its growth, the higher the manuring, and the larger the crop, the greater will be the proportion in it of this ill-famed plant.

3. *Arrhænatherum avenaceum*. *Fibrous-rooted, tall Oat-like grass.*

The reputed characters of this grass are, that it yields a considerable quantity of foliage on the culms, which affords a good deal of leafy feed in the spring. It is said to reproduce rapidly after cutting. Its taste is rather bitter, but it is not disliked by cattle. It does not grow abundantly except upon poor soils, and is upon the whole of somewhat questionable value ; it is, however, much grown in France. Its time of flowering is May. This grass, (in culm, &c.) stood third in amount on the unmanured land ; it there constituted, however, only six per cent of the total produce. Purely mineral manures raised its proportion to nine per cent. Ammoniacal salts on the other hand, whether alone or in admixture with the mineral manures, seemed adverse to its predominance. Its proportion with such manures (see plots 4, 10 and 13) was less than on the unmanured land. With farm-yard manure, as with mineral manures, the proportion of the oat-like grass was, as already alluded to, considerably increased. In fact, when the farm-yard manure was used alone, the proportion of this grass in the total produce was more than double ; and when with the addition of ammoniacal salts, about three times as great as it was on the unmanured plot.

The general conclusion to be drawn regarding the relative development of this grass, when grown in a mixed herbage, would seem to be, that, with high artificial manuring of the kind that meadow land is most likely to receive, it would not by such means alone be increased, but more probably diminished in its proportion in the total produce. But when farm-yard

* Under this very excessive manuring, the rye-grass appeared to be somewhat displaced in its proportion by the rough cocks-foot, which, on that plot, and on that alone, was very luxuriant.

manure is liberally used, or the soil is comparatively rich in mineral constituents, its development would appear to be encouraged. The result may be due, either to the special adaptation of rich mineral manuring to the luxuriant development of this grass, or to the fact that, with highly nitrogenous manures, its growth is somewhat checked by the greater luxuriance of the freer-growing grasses.

4. *Anthoxanthum odoratum*. *Sweet-scented Vernal grass*.

It is to the presence of this grass that the peculiar fragrance of newly made hay is due. Its foliage is broad and coarse, but the plant is a scanty grower, though most luxuriant on wet soils. It is not relished by cattle, but is not objected to in small proportion; it is said to be best adapted for sheep. Upon the whole this grass takes rank somewhat low in the scale of the better grasses for permanent purposes. It flowers early, namely, in April and May.

Our separations showed five and one-half per cent of the sweet-scented Vernal grass (in culm), in the produce of the unmanured land. There was only one other instance, namely, that where mineral manures were used alone, in which the proportion amounted to one per cent. The highly nitrogenous artificial manures appeared to be very adverse to its growth, nor did it succeed much better with farm-yard manure. As, however, this grass is a very early one, it is possible that, at the time of cutting, some of it would be past the stage at which it would be recognized in our samples.

The general result was, that the growth of the Sweet-scented Vernal grass was much discouraged by such manures as greatly increased the amount and proportion of the Gramineous hay-plants as a whole. Whether this is of consequence in any other point of view than that of fragrance, and whether in this one it is of real practical importance, is, perhaps, a question.

5. *Agrostis vulgaris*. *Common, or Creeping-rooted Bent-Grass, or Black-switch, &c.*

This grass is said to flourish most on dry soils, to be a troublesome weed on arable land, to be disliked by cattle, and also by sheep, excepting sometimes in winter. It is, in fact, reputed as useless, and is recommended to be discouraged as much as possible. The time of flowering is May.

This grass amounted, in culm, to nearly five per cent in the produce without manure. The proportion was, however, very much reduced under every one of the manured conditions. This result is certainly not to be regretted, if the characters of the grass are fairly given as above. However, the *detached leaf and undeveloped stem*, set down in the table as "midling," was supposed to consist chiefly, and that set down as "coarse," more or less, of bent-grass; and if this estimate be correct, it would appear that there was a considerable proportion of this grass in this undeveloped condition on most of the plots; though it would be least in amount where either the farm-yard manure or the mixtures of mineral manure and ammoniacal salts were employed. Fortunately, then, a grass having such a bad

character as is attributed to the creeping-rooted bent grass, seems to meet with the desired discouragement in those manures which develop more freely its more valuable congeners.

6. *Briza media*. *Common Quaking-Grass*.

This grass is reputed to thrive best on poor soils, to afford a small yield, not to be liked by cattle, and to be discouraged by manuring. It flowers in June.

The quaking-grass amounted to two per cent in the sample of the produce from the unmanured land. It was only found in two cases in the manured produce, and then in even less proportion than in the unmanured. In the most highly manured produce, none whatever of it was to be found. The reduction, or entire exclusion by manuring, is consistent with the character of this grass as given above. It would seem, therefore, that it is not likely to be troublesome on good land, and that it is easy of expulsion by good manuring.

7. *Cynurus cristatus*. *Crested Dog's-tail Grass*.

This grass is said to have a wide range of soils, to grow on dry, damp, and even irrigated lands, and to vary in character accordingly. The opinions given respecting its value are somewhat conflicting. Some authorities consider its root-leaves, which are comparatively abundant, to be a favorable food for sheep, and that it is useful on soils and in seasons when other grasses are deficient. The stems seem, however, not to be eaten at all; and the more recent opinions, especially those of Professor Buckman, are quite against its utility. It is said, however, to be better for pasture than for hay; but as its character is to die out by improvement, its perhaps now established inferiority need not be much regretted. The time of flowering is June and July.

This crested dog's-tail grass stood lowest of any among the grasses, in the scale of quantity, on the unmanured land. It there amounted, in culm, to only one per cent of the total produce. It was found in the manured produce in less proportion still, especially where ammoniacal salts were used. It would appear, therefore, that where such manuring is employed as greatly increases the produce of hay, there will be little or none of this doubtfully useful element.

8. *Dactylis Glomerata*. *Rough Cock's-Foot*.

The rough cock's-foot is said to be very abundant and productive on good soils, particularly on those of a clayey nature, and to be much improved by cultivation. It grows well in moist and shady places, has broad foliage, is tufty, and reproduces rapidly after cutting. All stock like it—but particularly sheep, early in the season, before it has become hard and coarse. Its time of flowering is June and July.

Of this grass, in the condition of flowering and seeding stem, none whatever was found in the sample taken from the unmanured plot; none in that from the mineral manured plot; and none in that from either of the

plots manured with farm-yard manure. It would, appear, however, from the notes made by Professor Henfrey, on the growing crop of 1857, as well as from the result of the partial separations made by ourselves, when the crop of that year was cut, that the rough cock's-foot was far more predominant in the second than in the third year of the experiment. The conditions of growth of the samples in which it was found in the third year, are consistent with its apparent exclusion under the conditions mentioned above. It was found to the amount of less than two per cent (in flowering and seeding stem) in the sample grown by ammoniacal salts alone, in less than one and a half per cent in that by the same amount of ammoniacal salts, with mineral manures in addition, but to the extent of twenty per cent, when the double or excessive amount of ammoniacal salts, together with the mineral manures, were employed. Where this very large proportion of rough-cock's foot was found in the produce of 1858, it was set down by Professor Henfrey in 1857, as "very fine," "abundant," and "ripe," and in the other cases as "backward." Consistently with this order of development of this plant, according to manuring, we find a very small proportion of that leafy produce (the coarse) which was estimated to contain cocks-foot, where the amount in flowering and seeding stem was so large, but more where the amount in flowering and seeding stem was only small. There was the most of it where the ammoniacal salts were used alone; and it was in the sample of "coarse" leafy produce grown by that manure, that Professor Henfrey concluded there was the most of the cock's-foot.

It appears that characteristically nitrogenous manures are favorable to the predominance of the rough cock's-foot. Where the supply of nitrogen is only moderate, it would appear to be outgrown and overpowered by the rye-grass and woolly soft-grass. It, in its turn, appears to overpower, particularly the rye-grass, when the nitrogenous manure is very abundant; and, under the same conditions, it seems to reduce, and almost to exclude, several of the grasses of less value, and of less free growth. Thus, when the cock's-foot was so abundant, there was less of the oat-like grass found than on any of the other plots; no sweet-scented vernal-grass, very little creeping bent-grass, no quaking-grass, and scarcely any crested dog's-tail. The reputed characters of the rough cock's-foot, given above, are consistent with this luxuriant growth under high manuring, and with this apparent tendency to push out other plants by its own active vegetation. The cock's-foot also affords an example of a useful grass much developed by those manures which yield a great bulk of total produce.

9. *Poa pratensis*. Smooth-stalked Meadow-grass.

The *Poa pratensis* is said to be rather particular in its choice of situation, not to relish damp soils, but to thrive well in good and rather dry ones. It grows tuftily, and is said to have the tendency to banish other grasses. Its character is to yield a good early feed, and a free-growing and hardy after-grass. It flowers in May and June.

This grass was found only in the samples of the produce grown by farm-yard manure. In these, however, its proportion was very considerable, amounting to about fifteen per cent of the whole where the farm-yard manure was used alone, but to only ten per cent where the farm-yard manure and ammoniacal salts were used together. From our records relating to the produce of the second season, it appears that this smooth-stalked meadow grass was detected on more of the plots in that season than in the third. Still, even then, it was found in very much larger proportion in the produce grown by farm-yard manure than in that by any of the other manures. This very marked development almost exclusively by farm-yard manure might lead to the conclusion, that part of the result was due to seed brought upon the land by the dung. But that the character of the manure, as such, had much to do with the effect, would seem from the fact, that the proportion of the smooth-stalked meadow-grass was considerably reduced when ammoniacal salts were used in addition to farm-yard manure.

It would appear that the smooth-stalked meadow-grass is particular in the choice of manure as well as situation, and that artificial nitrogenous manures are either directly obnoxious to it, or cause it to be pushed out by those grasses whose luxuriance is greatly stimulated by such manures. Nor was this poa perceptibly favored in its growth by purely mineral manures. It might be supposed, therefore, that the carbonaceous organic matter of the farm-yard manure had something to do with the greatly increased development of the plant under the influence of that manure. This greatly increased development of the smooth-stalked meadow-grass under the influence of farm-yard manure appeared to be chiefly at the cost of the woolly soft-grass—an exchange not at all to be regretted. The oat-like grass is another grass much more valuable than the woolly soft-grass, the proportion of which was much increased by farm-yard manure. This manure was seen, therefore, to develop two better grasses at the expense of a worse one. But it is to be regretted that so useful a grass as the smooth-stalked meadow-grass, should appear to be so nearly excluded under the influence of those so-called artificial manures, which are practically the most useful in increasing the produce of graminaceous hay.

10. *Bromus mollis*. Soft, or Downy Brome-Grass.

This grass is described as a common weed in grass land, the seed of which should be carefully excluded when sowing down. It is said to be innutritious, and even injurious to some animals. It flowers early in the season, but, after cutting, often seeds in the after-grass. It is found most in poor exhausted pastures.

With such characters as are here given to this grass, it is not to be regretted that it was found in only one of our samples, and there in very small proportion. Professor Henfrey was, however, of the opinion that its leaf occurred in a few of the samples of the "coarse" leafy produce.

11. *Avena pratensis*. Meadow Oat-Grass.

This grass is best adapted to dry, heathy places. It is of doubtful feeding value, though conflicting opinions are given respecting it. But, as it is said to be soon got rid of by good cultivation, its qualities are perhaps not of much consequence. It is the last on our list of *flowering and seed-ing graminaceous plants*. It was found in the samples from three, only, of the seven plots, and in those in but insignificant amount. The largest quantity was found in the sample grown by the mixture of mineral manure and the excessive amount of ammoniacal salts.

There are two other items to be briefly noticed, before closing this *seriatim* account of the different descriptions of the *graminaceous* herbage found in the produce of the respective plots.

The proportion of the *leafy* produce set down in the table as "fine," varied extremely, according to the manuring. It was very large where the ammoniacal salts were used *alone*, and moderately so on the other plots where the total produce was not very large; but very small in the samples from the heaviest crops. We were quite unable to determine, with any certainty, to what plant, or plants this "fine" leafy matter was to be referred. Professor Henfrey was, however, of opinion that some at least belonged to *Festuca Bromoides*, or Barren Fescue-grass.

"*Dead leaf and stem*," is the last item in the list of *graminaceous* produce. Contrary to the fine leaf, this worthless dead matter occurred in very far the largest proportion where the artificial manuring was the highest, and the crops were the heaviest. Where the mineral manure and the excessive amount of ammoniacal salts were employed, this damaged portion of the produce amounted to nearly twelve per cent of the whole; and where the mineral manure and the more moderate amount of ammoniacal salts were supplied, to seven per cent. Here, then, is experimental evidence showing a practical disadvantage in manuring so highly as to cause the crop to fall and die at the bottom before the bulk is fit for cutting.

II.—LEGUMINOUS HERBAGE.

In the second season, 1857, four descriptions of leguminous plants were distinguished on the experimental plots. These were *Lathyrus pratensis* (yellow or Meadow Vetchling); *Lotus corniculatus* (common Bird's-foot Trefoil); *Trifolium pratense perenne* (Perennial Red clover); and *Trifolium repens* (White, or Dutch clover). In the third season, 1858, very little of the last mentioned plant (Dutch clover) was observed on any of the plots; and the three other leguminous plants seemed to be confined to fewer plots than formerly. Their limitation, or extension, according to manuring, is very striking; and it is to the degree and conditions of their distribution, that attention is now to be directed. The results relating to these points are given in the third division of Table IX.

1. *Lathyrus pratensis*. Yellow, or Meadow Vetchling.

This plant is described to grow naturally on either moist or dry soils, but generally on such as are of good quality. Cattle generally eat it with

avidity ; and hence it is recommended to be grown on very dry soils. The creeping nature of its roots unfits it for growth in rotation, but not so much for permanent meadow. It flowers in July.

The meadow vetchling occurred in rather larger proportion than either of the other leguminous plants on the unmanured land. It there amounted, however, to only two per cent of the total produce. On the *mineral manured plot* its proportion was raised to four and a half per cent ; and on the plot with ammoniacal salts alone, there were about two and a quarter per cent. In the produce by the mineral manure and ammoniacal salts together, none of this plant was observed. The produce by farm-yard manure gave about two per cent, and that by farm-yard manure and ammoniacal salts, little more than one per cent of the meadow vetchling.

2. *Lotus Corniculatus*. Common Bird's-foot Trefoil.

This plant is said to grow abundantly on dry elevated pastures, and heathy soils ; and to be well deserving of cultivation on light, dry elevated inferior soils, on which it will yield a greater bulk of herbage than any of the cultivated clovers. It is supposed to be highly nutritious, and is eaten with avidity by cattle. From the great depths to which its roots penetrate, it is not liable to be injured by drought, and is hence enabled to retain its verdure after the grasses and other plants are burnt up. It flowers from June to August.

The bird's-foot trefoil was found in the produce of only two of the experimental plots, namely, the *unmanured* and the *mineral manured* ones.

3. *Trifolium pratense perenne*. Perennial Red Clover.

There are several varieties of this plant, of which the most important are the native perennial red clover, and the common perennial red clover or cow-grass. They are too well known to every farmer to require description here.

Perennial red clover amounted to little more than one per cent of the total produce on the *unmanured* land, but to nearly eighteen per cent of that grown by *mineral manures alone*. Not any of it was found in the produce by either ammoniacal salts alone, or ammoniacal salts in conjunction with mineral manures. There was little more than one and one-half per cent of it in the produce by farm-yard manures alone, and less than one-half per cent in that by farm-yard manure and ammoniacal salts.

The proportion of total *leguminous herbage* found in the produce of the *unmanured* plot was about five per cent. This was made up of two parts, meadow vetchling, rather less than two parts, bird's-foot trefoil, and rather more than one part perennial red clover. The produce by *mineral manures alone* was estimated to contain about twenty-three per cent of leguminous herbage, or about four and a half times as high a proportion as that grown without manure. These twenty-three parts comprised about four and a half parts meadow vetchling, about half a part of bird's-foot trefoil, and about eighteen parts of perennial red clover, fifteen times as much as was

found of it in the unmanured produce. The *ammoniacal salts alone*, reduced the proportion of total leguminous plant to little more than two per cent in the produce, and then it consisted entirely of meadow vetchling; the bird's-foot trefoil and the perennial red clover being apparently extirpated. And, in the produce by *mineral manure and ammoniacal salts together*, not any leguminous plant was to be found. The *farm-yard manure produce* contained less than four per cent of leguminous plant, which consisted of nearly equal parts, meadow vetchling and perennial red clover, to the exclusion of the bird's-foot trefoil. The *addition of ammoniacal salts* to farm-yard manure, reduced the proportion of leguminous herbage to about one-half. There was still no bird's-foot trefoil; and the perennial red clover, as before, gave way more than the meadow vetchling under the influence of the ammoniacal salts.

III.—MISCELLANEOUS HERBAGE, CHIEFLY WEEDS.

The fourth division of the table shows, that there were nine descriptions of these questionably useful or even objectionable plants, detected in the samples from the experimental plots. Only seven of them were found together on the unmanured land, and a smaller number still on each of the manured plots. A few remarks will be made upon the characters and conditions of occurrence, of these several plants, taking them in the order in which they occurred in the largest proportion on the unmanured land.

1. *Plantago lanceolata*. Rib-grass or Plantain.

This plant is reputed to yield an herbage which, early in the season, is eaten by cattle, horses and sheep; but which is disliked by them as the season advances. It is also objectionable on account of its spreading leaves, which tend to exclude other plants. It is natural to dry pastures. It flowers in June and July.

Nearly sixteen per cent of the produce, *without manure*, consisted of *miscellaneous weedy herbage*. This comprised seven descriptions of plant, yet nearly eleven out of the sixteen parts consisted of the rib grass. None of it was found in the produce grown by mineral manures alone; scarcely any in that by ammoniacal salts alone; less still in that by the same amount of ammoniacal salts and the mineral manures; and none at all in that by the double amount of ammoniacal salts and the mineral manures. On the farm-yard manure plot, less than two per cent of the total produce, or only about one-sixth as much as on the unmanured land, consisted of the rib grass. The addition of ammoniacal salts to the farm-yard manure, however, greatly increased the proportion of rib grass in the produce, namely, to eight and one-fourth per cent.

It appears, then, that the rib grass, which was so prominent an item on the unmanured land, was greatly reduced in its proportion by farm-yard manure and ammoniacal salts; still more by farm-yard manure alone; and nearly or entirely excluded by those artificial manures which increase the most the total produce of hay, and especially that of the graminaceous herbage.

2. *Carum carui.* *Common Caraway.*

This plant, though second in amount among the miscellaneous weedy herbage on the unmanured land, amounted there to less than two per cent of the total produce, and to about the same proportion in the produce of the two farm-yard manure plots. It was much diminished in its proportion, or excluded altogether, by the purely artificial manures, especially when ammoniacal salts were in relative excess.

3. *Achillæa millefolium.* *Common Yarrow or Milfoil.*

The milfoil is stated to be a grateful element, in small admixture with other herbage, for sheep; and it is recommended, therefore, to be sown with other seed for permanent sheep pasture.

The milfoil was found to the amount of somewhat more than one per cent in the produce without manure. Its proportion was much diminished by farm-yard manure alone, mineral manure alone, and the mixtures of the mineral manure and ammoniacal salts. Where the larger amount of ammoniacal salts was used (with mineral manure) both the proportion and the actual amount of this plant were considerably greater than where the smaller amount was employed with the mineral manures. Consistently with this effect of ammoniacal salts, the proportion of the milfoil was very much increased by the addition of these salts to farm yard manure; and it was the greatest, in fact, then nearly three times as great as without manure, where the ammoniacal salts were used alone.

If the characters of the milfoil, as sheep food, be such as above described, it need not, perhaps, be much regretted that its growth seems to be favored by nitrogenous manures.

4. *Rumex acetosa.* *Sheep's sorrel or Dock.*

This plant is, undoubtedly, objectionable. Unfortunately, however, it, as well as the milfoil or yarrow, was found in the produce of every plot; and, like the latter, it was increased in its growth by the use of ammoniacal salts. It was more or less increased by these salts in whatever combination they were employed. Farm-yard manure alone, also, notably increased the proportion of the dock in the produce; but farm-yard manure and ammoniacal salts together, increased it still more. With the latter combination, the dock amounted to more than three per cent of the produce. As this obnoxious plant seems to be favored in its growth by manuring, its expulsion must be attained by other means.

The remaining five plants that were detected in the samples are, without doubt, useless, if not obnoxious. They were each found, however, only on a few of the plots, and generally in but insignificant proportion.

5. *Silene,* or *Catch-fly,*

was found in the unmanured produce only, and there to the extent of little more than half per cent.

6. *Ranunculus. Crow-foot (various species.)*

These plants were found in small quantity, in the produce, from the unmanured plot; in larger proportion in that grown by ammoniacal salts alone; and in larger proportion still on the two plots with farm-yard manure. Their growth was, however, very much discouraged by the most productive artificial manures.

7. *Lazula Campestris. Field Wood-rush.*

This rush was found only in the sample from the unmanured land, and there in very insignificant amount.

8. *Veronica chamædrys. Germander Speedwell,*

was found only in the produce by mineral manures alone, and by farm-yard manure alone; and in both cases in very small amount.

9. *Galium verum. Common Yellow-flowered Bed-straw, or Cheese Rennet.*

This plant was only found in the sample grown by the mixed mineral manure in conjunction with the lesser quantity of ammoniacal salts.

It is possible that there were some other plants that either did not come within the reach of the scythe, or were otherwise excluded from our samples or determinations. Nor are the exact numerical proportions set down in the table, to be considered, either within this or the other classes of plants, as anything more than approximations. Such, however, they undoubtedly are; and the facts brought out regarding the distribution and development of miscellaneous weedy herbage, according to manure, are very clear and striking.

From this examination the very satisfactory result appears, that by far the larger number of the obnoxious or comparatively useless plants occurred in the produce of the *unmanured* land. Taken, collectively, too, their proportion was there very much larger than under any of the other conditions, excepting the one where the farm-yard manure and ammoniacal salts were used together. It was chiefly the rib grass and the sheep's sorrel or dock, that were encouraged by this latter manuring. The *farm-yard manure alone* gave a larger proportion of weedy herbage than any of the *artificial manures*; but not half as much as either the unmanured land, or that manured by *farm-yard manure and ammoniacal salts*. On all the artificially manured plots the number of species found was reduced to about half that occurring on the unmanured land. In fact, those artificial manures which were the *most productive*, not only reduced the number of species of weeds considerably, but reduced the proportion of the total of such produce to about *one-tenth as much* as was developed *without manure*. It is certainly very satisfactory to find, that the most active artificial manures had the effect of very greatly *reducing* the proportion of the useless and obnoxious plants in the mixed herbage of the meadow. It is on the other hand, somewhat discouraging to find, that the influence of *farm-*

yard manure, which must be relied upon for the hay crop to a certain extent, was not so favorable. It is to be hoped, that the facts which have been adduced regarding the conditions of development, and the amounts of the miscellaneous weedy herbage on the meadow land, may fix on the mind of the farmer, the clear idea which the discussion of actual figures conveys, of the real amount of objectionable produce which he may frequently grow, unless proper means of reduction or eradication be had recourse to.

Attention may now be turned from the detailed consideration of the circumstances of development of the *individual plants*, to a statement of the more general character of the herbage under the different manurial conditions. In the summary Table X, (page 137) are recorded the main facts necessary to such a review; and the most prominent results already noticed in their place in more detail, will supply the remainder.

1. *Total Graminaceous Herbage.*

At the time of cutting, 76 per cent of the produce, without manure, consisted of graminaceous herbage. At the same period of time, the proportion of such herbage in the total produce was increased to about 87½ parts by farm-yard manure alone, and to 79½ parts by farm-yard manure, together with ammoniacal salts. The produce by mineral manures alone, contained scarcely 72 per cent of graminaceous herbage; 4 per cent less, therefore, than the produce without manure. On the other hand, the produce by 400 lbs. of ammoniacal salts per acre, contained 89 per cent; that by the same amount of ammoniacal salts and mineral manures, 97½ per cent; and that by the double amount of ammoniacal salts and the mineral manures, also, 97½ per cent of graminaceous herbage.

But the *graminaceous produce itself*, varied extremely in character, according to the manure employed. At a given period of the season, the graminaceous herbage grown without manure, consisted of 66 per cent of flowering or seeding stem, and 34 per cent of leaf and undeveloped stem. At the same period, the graminaceous produce by farm-yard manure, comprised nearly 80, and that by farm-yard manure and ammoniacal salts rather more than 80 per cent of culm, in flower or seed. Against these amounts without manure, or by farm-yard manure, the graminaceous produce grown by the artificial manures alone, was composed as follows: That by the mineral manures alone contained 59 per cent of flowering and seeding stem; that by ammoniacal salts alone, only 40 per cent; that by the same amount of ammoniacal salts and mineral manure, 75 per cent; and that by the double amount of ammoniacal salts and mineral manure, 67 per cent., in flowering and seeding culm.

The general result is, that those manures which much increased the produce of hay, at the same time very much increased its proportion of graminaceous herbage. In fact, where the largest crops were obtained, namely, where the mixed mineral manure and ammoniacal salts were used together, the proportion of the whole produce that was graminaceous, was

more than 97 per cent., whilst that without manure was only 76 per cent. The characteristic effects of nitrogenous manures to increase the proportion of leaves and shoots, and of mineral manures to determine more to flowering and seeding, are also strikingly illustrated. It will be obvious, therefore, that not only must the character of the gross produce be very different according to the description of manure employed, but that the proper time of cutting must vary very considerably to secure the majority of the herbage at any given point of ripeness.

But it has been seen that the graminaceous herbage varied much in character according to the manure, not only in regard to its proportion in the total produce, and to the proportion of the whole that was leafy and stemmy respectively, but also in the description or species of plants developed.

Under the particular conditions of soil, season, original distribution of plants, and other circumstances of these experiments, common rye-grass was the most predominant of the grasses in the unmanured produce. The inferior woolly soft-grass, occurred in nearly an equal quantity; and then succeeded, in lesser quantities, in the order here given, the tall oat-like grass, the sweet-scented vernal-grass, the creeping-rooted bent-grass, the common quaking-grass, and the crested dog's-tail—the last in very small amount. Farm-yard manure, which increased the actual amount and proportion of total graminaceous herbage, gave a considerably increased proportion of rye-grass and of tall oat-like grass; a somewhat diminished proportion of the woolly soft-grass; scarcely any of the other grasses found on the unmanured plot; but a very large amount of the valuable smooth-stalked meadow-grass, which was not found at all in the produce without manure. The addition of ammoniacal salts to the farm-yard manure diminished the proportion of the more valuable rye-grass, and smooth-stalked meadow-grass, but increased that of the tall oat-like grass, and that of the inferior woolly soft-grass.

Leaving out of consideration, here, those artificial manures which did not much increase the total produce of hay, namely, the mixed mineral manures used alone, and the ammoniacal salts alone, the general result with the more active artificial combinations was as follows: The mixed mineral manures with the more moderate amount of ammoniacal salts gave about two and a half times as much produce as the unmanured land, and the proportion of it that was graminaceous was more than ninety-seven per cent, instead of only seventy-six per cent without manure. This enormously increased graminaceous produce contained twice as high a proportion of both the valuable rye-grass, and the inferior woolly soft-grass, as that without manure. The proportion of the oat-like grass was, on the other hand, diminished; and, under the same conditions, all the other grasses were either very much reduced, or entirely excluded.

When the double and excessive amount of ammoniacal salts was employed (with the mineral manure), the produce was about two and three-fourth times as much as on the unmanured land, and the proportion of it that was graminaceous was, as in the last case mentioned, more than ninety-

seven per cent. This greatly increased graminaceous produce, under the influence of an excess of ammoniacal salts, contained a smaller proportion of the common rye-grass than the unmanured hay. On the other hand, the proportion of the inferior woolly soft-grass was very much increased. There was, moreover, with this manure, a very large proportion of rough cock's-foot, a grass which was found on very few of the other plots, and then in very small proportion. All the other grasses were either excluded or much reduced in amount, under the influence of this excessive manuring.

2. Total Leguminous Herbage.

The proportion of leguminous herbage in the total produce without manure, was about five per cent. Farm-yard manure reduced the proportion, but not the acreage amount, of such produce; and the combination of farm-yard manure and ammoniacal salts, very considerably reduced both the actual amount and proportion, of this kind of herbage. In the produce by those artificial combinations (mineral manures and ammoniacal salts), which more than doubled, or nearly trebled the amount of hay, and which increased the amount and proportion of the graminaceous herbage so strikingly, not a trace of leguminous herbage was found. Again, ammoniacal salts alone, which notably increased the graminaceous herbage, almost excluded the leguminous. In the produce with this manure, neither bird's-foot trefoil nor perennial red clover was found; but the meadow vetchling occurred in about the same proportion as in the unmanured produce. On the other hand, mineral manures alone, which gave little or no increase of graminaceous produce, increased, very strikingly, both the actual amount and the proportion, of the leguminous herbage. The proportion of total leguminous herbage in the produce by mineral manures alone, was twenty-three per cent, instead of only five per cent in that without manure. The proportion of the bird's-foot trefoil was diminished by the mineral manures; that of the meadow vetchling was notably increased; and that of the perennial red clover very considerably so.

The effect of *mineral* manures in developing a large proportion of *leguminous* herbage, and particularly of clover, was therefore very striking. Artificial *nitrogenous* manures, on the other hand, seemed almost to extirpate such plants from the mixed herbage of the meadow-land. These results are perfectly consistent with those observed in the manuring of leguminous crops (beans, clover, &c.) when grown in rotation. Mineral manures have been found greatly to increase such crops, whenever a good plant could be once obtained, and the season was not unfavorable. These crops, on the other hand—so highly nitrogenous, both in their per centage composition, and in their acreage yield—have not been found to be specially benefited by the direct use of ammoniacal salts; though nitrate of soda appears somewhat more favorable to their growth.

The general coincidence in the results obtained in regard to the action of characteristic descriptions of manure, on the agricultural plants included within each of these two great families (the graminaceæ and leguminosæ),

whether they be grown *separately and in alternation, or side by side in a mixed herbage*, is very striking. Such a coincidence, under such very varied conditions, must show, that the result is really due to the plants of the respective families requiring for their luxuriant growth a widely different relation of the mineral and nitrogenous supplies, respectively, *within the soil*. It cannot, under such circumstances, be attributed to mere local peculiarities, or to the mere accidental conditions of exhaustion induced by this or that agricultural practice. We have, then, in the facts observed in regard to the action of characteristic descriptions of manure in developing the different plants of which the *mixed herbage of a meadow* is made up, an unexpected and very interesting confirmation of those which have been established in regard to the development of the widely different plants which are grown in *rotation*. Such a coincidence must tend to inspire confidence in the conclusions arrived at in each of the widely different, and separately interesting paths of inquiry.

3. Total Miscellaneous Herbage (chiefly weeds).

These plants were the most numerous in kind, and nearly in the greatest proportion, on the unmanured land. The produce without manure contained nearly sixteen, that grown by farm-yard manure and ammoniacal salts more than sixteen, and that by farm-yard manure alone seven per cent of miscellaneous or weedy herbage. In the produce without manure, about two-thirds of the amount of such herbage was plantain or rib-grass; and in that by the farm-yard manure and ammoniacal salts about the same proportion of the whole consisted of rib-grass in the larger, and sheep's sorrel or dock in the smaller quantity. On the other hand, the produce grown by those artificial manures which gave the largest crops of hay, contained less than two per cent, and a very few species of miscellaneous weedy herbage.

So much then for the result of this enquiry into the comparative development of the *different plants* of which the complex herbage of a meadow is made up, according to the manures employed. The subject has been treated of with much more of system and detail than would otherwise have been necessary, inasmuch as, so far as we are aware, this is the first attempt that has been made to trace the influence of special manures upon the individual plants of a complex herbage.

It must not be concluded, however, that the degree in which a particular description of manure develops any particular plant, when it is thus grown side by side with many others, is necessarily the same, either actually or relatively to those beside it, that it would be were each plant grown separately with such manure. The natural habit of a plant, its relative stage of progress at the different periods of the season, and its range of distribution, both above and under ground accordingly, must indirectly affect the degree of luxuriance of the other plants associated with it. But as it is in this *collective* way that the various plants are grown in our permanent meadows, it is the action of different manures upon their development under these complex conditions, that is of the most interest to the farmer.

Again, the conditions of soil, situation, season, and of the original distribution and predominance of the respective plants, must, to a great extent, affect their relative development by different manures when they are thus grown side by side. There is, moreover, evidence in the general observations made, or notes recorded, on the produce of the first two years in the experiments now in question, that there has been a *progression* from year to year in the greater development of some plants, and in the reduction, or even exclusion, of others, the conditions of manuring remaining the same. It would appear, indeed, that great caution should be exercised in the application of artificial manures to *good feeding* pastures, lest the effect should be, to increase the growth of certain grasses of inferior quality, and to diminish or exclude those to which the high feeding value is attributable.

It is obviously very important, not only that the progressive action of the different manures should be carefully investigated for years to come in the case of the experiments on the Rothamsted meadow land, but that experiments of a similar kind should be conducted by others in different localities, and on different descriptions of soil. So far as our own part in the matter is concerned, we hope to follow up a subject which seems fraught with so much interest, both in a practical and scientific point of view. And we trust that others will be found to lend their aid in extending information in this important and hitherto untrodden field of inquiry.

From a review of the whole of the facts adduced in this third part of our report it would appear:

1. That, whether the produce of hay be considerably increased by means of farm-yard manure alone, farm-yard manure and ammoniacal salts, or artificial mixtures of suitable mineral manure and ammoniacal salts, the proportion of the whole which will be *graminaceous* will be very much increased.

2. That the produce will be by far the *most graminaceous* when the "*artificial mixtures*" are employed. In fact, when the increase of hay is obtained by artificial manures containing *both the necessary mineral constituents and ammoniacal salts*, and it is then greater than under any of the other conditions, both the *leguminous* and the *weedy* herbage are nearly excluded, and the produce is then, therefore, *almost wholly graminaceous*.

3. That the *graminaceous produce itself*, when grown by farm-yard manure, is less complex in its character than that grown *without manure*; whilst that grown by the *most active artificial manures* is *less complex still*.

4. That, up to an equal period of the season, the *graminaceous produce* grown by the active artificial manures, will be in larger proportion in *flowering and seeding stem*, than that grown *without manure*; and that the produce grown by *farm-yard manure* will be in still larger proportion in that condition.

5. That the *description* of the produce grown by *farm-yard manure alone* was, upon the whole, superior to that grown *without manure*.

6. That when the crop was further increased, by the *addition of ammoniacal salts to the farm-yard manure*, the character of the produce was somewhat deteriorated, both in regard to the *description* of the useful plants grown, and on account of the large proportion of *miscellaneous or weedy herbage* then developed.

7. That, when in a *mixed mineral and ammoniacal manure* the ammoniacal salts were *not used in excessive amount*, the herbage, which was then almost exclusively *graminaceous*, and comprised also but *very few species*, nevertheless, included a considerable proportion of grasses of recognized good quality. But, *when excessive amounts of ammoniacal salts were employed*, the character of the produce was deteriorated, both in regard to its condition, and to the *description of the grasses* that were developed.

TILE-DRAINING.

JOHN JOHNSTON, OF SENECA COUNTY.

The gentlemen whose names are annexed, presented to Mr. Johnston a service of plate as a testimonial of respect for his valuable efforts in tile-draining. Mr. Johnston has shown, by many years of actual demonstration on his own farm, the great value of tile-draining in stiff soils, and the large increase of crops as a result. Mr. Johnston is now quite advanced in life, being about seventy years of age, and this testimonial must be gratifying to him, showing the appreciation of his labor for many years for the advancement of agriculture in his adopted state and country.

We give the description of the testimonial presented him :

"The testimonial consists of a massive silver pitcher and two goblets, on all of which are engraved and embossed appropriate agricultural emblems. On one shield of the pitcher is represented a reaping field, as it appears in our day, on another a mowing machine at work, and the third bears the following inscription :

Presented to John Johnston, in recognition of his services to the Agriculture of New York, by his fellow-citizens :

John A. King, B. P. Johnson, Henry Wager, A. B. Conger, William Kelly, James J. Mapes, Lewis G. Morris, B. N. Huntington, James O. Sheldon, J. B. Williams, Luther Tucker & Son, Samuel Thorne, Erastus Corning, Jr., D. D. T. Moore, A. P. Cumings, A. O. Moore, James S. Wadsworth, C. & W. McCammon, Addison Gardiner, Henry S. Olcott.

The goblets bear representations of men laying tiles for drains, a ditch-digging machine, tile machine, and all manner of small tools used in "the stupid burial of crockery"—as an English lord was pleased to term tile-draining a few years ago."

Mr. Johnston has occupied the farm upon a portion of which he now lives, near Geneva, for upwards of thirty years, and has there fully and successfully developed the advantages of tile-draining. In the early commencement of his operations he was met by distrust on the part of those around him; but with untiring zeal he pursued his improvements, and has been permitted to live to reap the fruits of his well directed efforts, and to find, at his advanced period of life, constant demands, from every section of our county, for information in relation to draining, than whom no man is better prepared to give all that may be desired for practical purposes.

In the Transactions of the Society for 1851, p. 250, may be found an

article on draining, giving a full account of Mr. Johnston's operations upon his farm up to that time. It also gives a detailed account of the difficulties encountered in his early operations. He had, up to that time, laid about sixteen miles of drains. This is one of the first articles, we believe, which Mr. Johnston published giving a full account of his operations. Its influence upon the farmers of our State was most salutary, and the numerous visitors to witness these improvements testify to the great value of his labors.

In the Transactions for 1855, p. 257, is another article from Mr. Johnston, addressed to the members of the Seneca County Agricultural Society. In this Mr. Johnston gives the benefit of his experience in laying tiles, and his directions are so full, so plain and intelligible that no one need mistake who will be guided by his directions. He shows, in this article, the saving of his crops on drained lands from the ravages of the wheat midge, and the effect which this had upon many farmers, who, until their crops were nearly destroyed, while his remained almost entirely uninjured, could not be induced to drain their lands. Mr. Johnston states, in this article, the obstacles he had to contend with, and it is a matter of great rejoicing that he persevered notwithstanding all these, and has occasion to rejoice at the results. He says, "He commenced under unfavorable circumstances in different ways. First, for want of funds; next, the tile cost double what they do now; and last, though not least, public opinion was very much against me. Some would ask if I was going to *put crockery all over my farm?* Some would tell me that they thought my farm was rather too dry, if anything; and some of my own countrymen would give me the hint that they had known some men drain and otherwise improve their lands so that they lost them. * * * Notwithstanding all this, I still felt confident that my draining would end well if I lived, as the excess of two years' crops after draining would pay the cost; and I persevered, and the more I drained the more I was convinced I was right, and I have not been disappointed at the result, as my fondest anticipations have been realized.

"If I am spared until next June, I shall have every field drained; but in some fields that I drained some years ago I will put in a few more tiles."

We rejoice that Mr. Johnston has been spared to complete this great work, ever to remain as a memorial of his intelligence, his industry, and his perseverance; an example to the American farmer which is being followed, and will continue to progress more and more until our land is redeemed. And what untold millions will these improvements give to the American farmer; and well may they pay tribute to John Johnston for the great work he has performed among them.

J.

T. C. MAXWELL & BROTHER—GENEVA.

First Premium.

The number of acres drained is thirty (30) and the whole number of rods laid is twenty-four hundred and forty-five (2,445 rods.)

The general course of the drains is directly down the slope; the distance apart is two rods, (2) and the depth $2\frac{1}{2}$ to 3 feet—an average of $2\frac{1}{2}$ feet. For the *main* drains we used six inch horse-shoe tile; sub mains, four and five inch, and the laterals three inch horse-shoe and two inch pipe tile; field No. 1 being drained with the latter, and No. 2 with the former; the general character of the soil of these two fields is a gravel and clay loam; the subsoil of No. 1 is a heavy clay—while No. 2 is clay and gravel.

No. 1 was drained principally by hand, at an average cost of 34 cents per rod; No. 2 was done at a less cost, by using a common plow at first, and afterward a *subsoil* plow for opening the drains; the average cost of this was thirty cents per rod (30c).

This completes nearly two hundred acres, thoroughly drained, with tile, after the same general plan; in doing this we have used about 200,000 *tile* of different sizes, and laid 16,000 *rods*, or a little over *fifty miles* of drain, at an aggregate cost of \$5,000; this would seem a very large expenditure—but our lands are greatly improved in tilth and friability, and our crops are increased both in quality and quantity; hence we are thus far, well satisfied with the investment.

T. C. MAXWELL.

W. T. & E. SMITH—GENEVA.*Second Premium.*

The situation of the land, where this drainage has been done, varies much in regard to getting fall for the water, varying from one-fourth inch to four inches fall to the rod. Soil gravely loam, strong clay, and in places clay loam, a great share of it being very wet and entirely unfit for crops.

The most of this work has been done by hand, although we have sometimes used the subsoil plow for the first eighteen inches, but are not able to say that the plow has any advantage over the spade in saving expense; but we would say, that so far as our experience goes, that hand labor is the cheapest. The cost of digging has varied according as we have hired hands, whether by the month or by the rod; the average cost of this draining has been about thirty-one cents per rod, or \$100 dollars per mile, the amount of miles now laid by us being about fifty-five, the principal part of which has been done as follows: 1857, ten miles; 1858, seventeen miles; and in 1859, thirteen miles. Tiles used have been principally two inch pipe, two and one-half inch pipe for side drains, and four inch horse-shoe and six

inch horse-shoe for main-drains. Great care has been bestowed upon this work in bottoming these drains, and we would say that they work admirably.

The result and the increased value of the land is getting to be too well known to need comment, but we would say that without it our crops are small, but with it large.

The distance the drains have been laid apart. In a strong clay subsoil, twenty-four feet, and two and one-half feet deep; In a gravelly subsoil, three rods apart, and from three to four and one-half feet deep.

W. T. & E. SMITH.

POTATOES.

REV. E. C. GOODRICH'S EXPERIMENT WITH POTATOES.

UTICA, Jan. 20th, 1860.

Mr. JOHNSON—It was my privilege to present, at the winter exhibition of the New York State Agricultural Society, held at Albany, February, 1859, numerous varieties of seedling potatoes. Of the first division of these, consisting of seventeen older seedlings, originated from 1848 to 1854, and which embrace the six varieties named and before the public, I do not propose to say anything here, as their character has been determined by long cultivation.

Of the remaining eighty-two sorts, which are seedlings of 1856 (except two of 1855), I will speak more particularly, since they were not presented as thoroughly tested, but were considered as yet on trial.

In the year of their origination they consisted of 1,300 varieties. From these, 391 were selected for culture in 1857. From these, again, 168 were cultivated in 1858. Of these lastly, 82 were continued on trial in 1859. This sifting of large families of seedlings, and their culture, through successive years, is made necessary by the fact that not until a new sort is four or five years old, is its character settled so as to entitle it to confidence. I will not cover your pages with a statement of the culture of each one of these eighty-two sorts, but mark the best of them, mingling among them others of inferior quality, so as to show some of the reasons why they *should be*, as the remainder *have been* rejected.

Culture, Weather, &c.

a. I planted on green sward, turned over in March, so that the spring frosts might kill the worms supposed to be in it. I would have preferred November to March, but was not able to get it done. The plot proved to be quite wet in parts, and so had to be drained after it was plowed. This left much cold, lumpy clay on the top of the soil, besides trampling it down very much. These things I could not help, as it was hired, ground fitted by the owner.

b. The plot contained two and a half acres, presenting quite a variety of soils: some light sand, but mostly a clay gravel. Full one-half of it was pretty rich, it having been an old pasture, on parts of which cattle had been fed.

c. It was harrowed and furrowed the first week of May. I planted three or four inches deep; I would have preferred five or six, but could

not without disturbing the sod. I planted three by three feet, thus making 4,840 hills to the acre, by calculation, and proved to have almost exactly so many by counting them.

d. The grasshoppers did me much hurt in August and September, very greatly injuring some of the sorts by trimming off the leaves.

e. The season was not, on the whole, favorable to the health of potatoes, the old varieties, except when planted on poor soils, rotting badly. July presented frequent rains, with intervening warm and windless weather. This produced mildew on the grapes and the potatoe of the common varieties. September, from 12th to the 18th, showed some frost, with severe winds, which injured the vines and leaves of this crop. I forgot to say that the frosts of the 6th and 12th of June, cut down most early potatoes even with the ground, reducing all so hurt, to one-half a crop, and sometimes less.

f. It will be seen that some of these new seedlings were diseased, two or three sorts considerably. Had the soil been old, and of the same degree of fertility, instead of being green sward, the crop would have ripened from ten to twenty days earlier. In this case I think that even my feeblest sorts would have escaped disease.

g. They were harvested from the 15th of September to the 20th of October, according to the time of maturity.

h. It will be seen, that notwithstanding the drawbacks that have been mentioned, I had a very large yield. This must be credited to the constitutional hardiness of the sorts. The old varieties, on a clay soil, as rich as this, and upon a green sward, too, would doubtless have been nearly a failure from disease, especially those sorts maturing late.

i. In the following table, the first column marks the different sorts sent, from 1 to 35. The second column indicates the time of the maturity of each sort; 1 marking the extra early, and 5 the very late. The third column marks the yield of each sort per acre. This last is easily made out by remembering that an acre furrowed three feet wide each way, contains 4,840 hills. If, then, 12 hills are found to yield 60 pounds, (equal to one bushel) of tubers, the yield is at the rate of 400 bushels to the acre; or if 16 hills, then of 300 to the acre; or if 24 hills, then 200 to the acre, and so of intervening quantities, measuring only hills of medium yield.

No.	Yield per acre in Maturity. bush.		Remarks.
1..	4	248	Yellow flesh; no disease; a noble sort.
2..	5	257	No disease; very perfect; though very late.
3..	3	220	No disease; very beautiful.
4..	4	188	The least trace of disease; very beautiful.
5..	4	220	No disease; very beautiful.
6..	3	322	Forty diseased tubers in 107 bushels; very fine.
7..	4	230	Three pecks diseased tubers in 12 bu.; late; doubtful.
8..	3	255	No disease; beautiful; very perfect.

No.	Yield per acre in		Remarks.
	Maturity.	bush.	
9..	5	167	One-third bu. diseased tubers in 13½ bu ; fair tubers.
10..	4	284	No disease ; very perfect sort every way.
11..	4	312	Three bu. diseased in 31 ; ground damp ; very promising.
12..	4	244	The least trace of disease ; very fine.
13..	5	237	One-seventh part diseased ; very late ; bad.
14..	4	255	A little disease ; rough ; grow out of ground ; bad.
15..	5	293	No disease ; fine, but very late.
16..	5	230	do do do do do peculiar vine.
17..	1	242	Much dwarfed and diseased ; not very promising.
18..	2	103	Much diseased and dwarfed ; not promising ; damp soil.
19..	3	218	A little disease ; beautiful, but push out of the soil ; doubtful.
20..	2	118	A little disease ; much dwarfed ; not so hopeful.
21..	4	372	A mere trifle of disease ; this is the cap-sheaf yield ; deep eyed, and a very noble sort.
22..	3	138	No disease ; nice sort ; but small yield.
23..	3	230	No disease ; good.
24..	3	230	No disease ; deep eyes, but promising.
25..	4	142	No disease ; fair, but poor yield.
26..	4	322	No disease ; long ; blue ; very fine ; noble look and yield.
27..	4	257	Much dwarf ; fine tuber ; uncertain.
28..	1	230	Extra early, and no disease, but badly dwarfed ; uncertain.
29..	4	193	Badly hurt by June frosts, by grasshoppers, and hence much disease, yet very fine tubers ; uncertain.
30..	3	105	No disease ; fine ; fair yield.
31..	3	124	do do do
32..	4	<div style="display: inline-block; vertical-align: middle;"> <div style="display: inline-block; vertical-align: middle;">good</div> <div style="display: inline-block; vertical-align: middle;">but no</div> <div style="display: inline-block; vertical-align: middle;">exact</div> <div style="display: inline-block; vertical-align: middle;">record</div> </div>	These four sorts had no disease, but I have no exact record of the yield which was good.
33..	5		
34..	4		
35..	4		

Remarks on the preceding Table.

Jan, 20th, 1860.

1. The failure of the *extra early* sorts seventeen and twenty-eight, and of the *early* sorts, eighteen and twenty, was a great disappointment, more particularly that of twenty-eight, which is a variety that gave very high promise before it began to dwarf. These sorts were badly treated this year. Early varieties need a quick soil whose fertility is at once available, as they make the most of their growth early in the season. But placing them, as I did, on a green sward, whose fertility is not highly available until midsummer, they dwindled early in the season, and then took on a second growth at midsummer when they should have begun to mature.

2. In a few cases a little disposition to dwarf was seen in some of these sorts, when that fact is not noticed in the remarks appended to each sort.

3. The yield of many of these sorts is large, considering all the circum-

stances. There are thirty-five sorts raised on soil not in a highly favorable condition, much of it being heavy, hard and often too damp, though fertile. Yet here are twenty-one sorts of 220 bushels or upwards to the acre. Of these again ten go as high as 250 bushels to the acre or higher; and four go above 300 to the acre.

4. It will be seen also that the maturities marked three and four, that are neither so early as numbers one and two, nor so late as number five, have usually produced the largest and healthiest crops. The reasons of this result could readily be made plain were there room here.

Appendix.—Somewhat late in the season I procured a small plot of ground for the trial of a few old sorts, my older seedlings, and some new sorts (not my own) now before the public.

The soil was a coarse, gravelly loam, well drained by position and sloping to the north, which are all favorable considerations in the culture of the potato. It had, however, been kept under potatoes constantly for a great many years, no one could tell how long. It was also very poor. I manured my crop sparingly in the hill with a compost made of night-soil and coal ashes, well elaborated.

The results cannot be justly compared with the table above, for the soil, even when manured, was poorer than that, while, in its other circumstances it was much more healthfully situated.

The yield was medium, and no disease was seen, except on two tubers of the early pink eye,—the Dykeman of some gardens.

1. Early pink eye, 24 hills to the bushel.
2. Early Mountain June, 22½ hills to the bushel.
3. Davis Seedling, 30 hills to the bushel. Small vines, pretty tubers.
4. Prince Albert, 25 hills to the bushel. Tubers pretty, rather small.
5. Miner's Clinton, 26½ hills to the bushel. Rough tubers and small.

My older seedlings.

6. Black Diamond, 24 hills to the bushel. Smaller than usual.
7. Garnet Chili, 20 hills to the bushel. Very fine.
8. Ovate Peruvian, 22½ hills to the bushel. Very fine.
9. New Hartford, 19 hills to the bushel. Very fine.

What the result might have been in a larger experiment (I planted but twenty or thirty hills of each), and on a different soil, in the case of *Davis' Seedling*, the *Prince Albert* and *Miner's Clinton Seedling*, I cannot tell, but thus far they are inferior in yield and size of tuber, not only to the sorts named with them above, but to many others of my seedlings (not particularized) planted on the same soil.

It is proper here also to observe that the new *Peach Blow* variety, though a beautiful tuber and a fine table sort, is here very late, and escaped being badly diseased only by being put on poor soils, rich soils, in this neighborhood showing considerable disease in the field and more still in the cellar.

C. E. GOODRICH.

EXTRACTS FROM REPORTS OF COMMITTEES AT STATE FAIR, ALBANY, 1859.

SHORT HORNS.

LEWIS G. MORRIS, FORDHAM, WESTCHESTER COUNTY.

The committee having noticed, upon the grounds, the amateur herd of Col. Lewis G. Morris, of Fordham, Westchester county, obtained his consent to have them led into the ring for examination, although none of them were competing for prizes. There were six females and one male, all of a uniform, rich roan color, and with pedigrees traceable, not only to the oldest and most celebrated herds in England, but to the very best animals in those herds. Col. Morris was, for many years, one of the very best breeders in the United States; and, in connection with the much lamented late Noel J. Becar, he made some of the most valuable and costly importations. Since the death of Mr. Becar, Col. Morris has sold out to Samuel Thorne, Esq., of Dutchess county, to whom so many prizes have been this day awarded. The object of Col. Morris in his little herd is to retain and perpetuate the blood of some animals that have united the best constitutions and beef making qualities with the best milking qualities, at the same time preserving symmetry of form and a rich roan color.

As the ambition of Col. Morris is only for a small herd, the committee do not doubt, from his experience and skill in breeding, that in time he may found a herd of cattle capable of conveying to other herds those valuable characteristics which he is now laboring to firmly establish in his own.

The committee not only commend the herd of Col. Morris, but his efforts to unite in it so many valuable qualities that experience has demonstrated as desirable.

JOHN WENTWORTH, for committee.

REPORT ON AYRSHIRE AND ALDERNEY CATTLE.

The committee who had the honor of being selected by the officers of the New York State Agricultural Society to adjudge on the merits of the Ayrshire and Alderney cattle, have attended to the duty assigned them, and beg leave to report: That there were thirty head of Ayrshires, consisting of bulls, cows, heifers, and calves, and that they have examined the different animals presented to them with much care and attention; and in doing which your committee have endeavored, so far as their judgment would lead them to take into consideration the interest and use of the farmer as well the owner.

ALDERNEY CATTLE.

Your committee beg leave to express their regret that the exhibition of Alderney cattle, a new and valuable race in this section of country, were not more numerous; two bulls, two cows, one heifer and one bull calf constituted the whole that were presented for examination; of course our duties were not very arduous.

This race of cattle are termed in England the "rich man's cow," as they are generally kept in gentlemen's parks or tethered in their lawns, for the use of the family in the mansion, as they give the richest milk; but when we take into consideration that from eight to fourteen pounds of good rich butter per week may be made from their milk, and the butter commanding from forty to fifty cents per pound, we should be inclined to call her, in fact, the "the poor man's cow."

It has been urged that the Alderney cow "is a voracious feeder, lean, awkward in appearance, and when old, will make but little beef." We have seen statements of cows of this breed, which have produced, "198 pounds of butter in five months; another produced 317 pounds in the year; a third, a three year old, 297 pounds in the same time; a fourth, a two year old, from the first of April to November, there was made from her milk, 200 pounds of butter. Greatest yield per week, ten and one-half pounds, and made seven and one-half pounds in September.

C. N. BEMENT,

Chairman.

GRADE COWS AND HEIFERS, AND MILCH COWS.

The committee report that entries Nos. 89, 113, 154 were well worthy of notice, but in compliance with the regulations of the Society, in regard to "over fed animals," the object of the Society being to secure animals suitable for breeding purposes; the committee deem it to be their duty to withhold premiums from these animals, *for the reason* that they are far better suited to the butcher than to the farmer as breeding animals.

ROBERT WILLETS,

Chairman.

WM. H. SLINGERLAND—NORMAN'S KILL, ALBANY CO.

MILCH COW.—1st Premium.

Statement.—Cow "Jenny Lind," thorough bred short horn, eight years old. She has been kept on grass only from about the first of June last, until about the first of September. Since the first of September she has been fed on a few pumpkins. The grass upon which she was pastured was timothy and white clover, and was very short from the 1st to the 20th of August (on account of the drought).

From 10th to 20th of July (10 days), gave 730 lbs. of milk, 22 lbs. 4 ounces of butter.

From 10th to 20th of August (10 days), gave 675 pounds of milk, 20 pounds 10 ounces of butter.

CLASS NO. 2.—HORSES.

The horse is one of the most useful, as he is one of the most beautiful, of our domestic animals. And it would be interesting, if time and leisure permitted, to trace his history as we gather it here and there, scattered through profane and sacred literature.

It seems probable, if not quite certain, that Egypt is the country of his origin. At least we have no account of horses being used by man earlier than the time of the sojourn of Jacob in that country. "Chariots and horsemen," we are told, were attendants at the celebration of the funeral of the good old patriarch.

There seems to be no good reason to suppose that the horse was a native of either China or of Hindostan, since all their native animals are of an entirely different type, and since, with regard to the latter, it is impossible that the horse could ever have existed, in a wild state, amidst their numerous and terrible beasts of prey.

Nor was the horse an original inhabitant of America. The Europeans did not find him here. The immense droves of wild horses which roam over the central parts of America, are the progeny of European horses brought here by discoverers and colonists.

It is quite certain that in ancient Canaan, though asses abounded, they had no horses. Our father Abraham, well to do in the world, as we have heard, nevertheless rode an ass. We are not told that he was "*fast*," like the boys of the present day, but had he been so, he had no means of getting up a speed of 2.40. And this, for aught I know, may have been the reason why he was so staid in his habits. With all his mighty professions he could not indulge in the delights of the race course. There was no Epsom, or New Market, or Long Island. Some speed, indeed, might be got out of his asses or his cows, but it never occurred to him, so far as we can learn from Scripture, to test their relative speed by mounting one of them while Lot mounted another, with spurs on heel and whips in hand, and whisking across the plains of Sodom. What a deal of sport the old slaveholders must have been deprived of!

Buffon accords the horse the most admirable qualities.

"The noblest conquest," he says, "which was ever made by man, is that of this spirited and haughty animal, which shares alike with him the fatigues of war, and the glory of the combat. Equally intrepid with his master, the horse sees the danger and braves it; inspired at the clash of arms, he loves it, he seeks it, and is animated with the same ardor. He feels pleasure also in the chase, in tournaments, in the course; he is all fire, but equally tractable as courageous, does not give way to his impetuosity, and knows how to check his inclinations; he not only submits to the arm which guides him, but even seems to consult the desires of his rider; and always obedient to the impressions, presses, moves gently, or stops, and only acts as his rider pleases. The horse is a creature which renounces his being to exist only by the will of another, while he knows how to anticipate and even to express and execute by the promptitude and exactness

of his movements; he feels as much as we desire, does only what we wish, giving himself up without reserve, and refuses nothing, makes use of all his strength, exerts himself beyond it, and even dies the better to obey us.''

This learned old Frenchman is evidently an enthusiast, in regard to horses, as much so as a certain other gentleman I wot of, living very near the Troy City Bank.

But admitting that the character which he here sketches is somewhat overdrawn—admitting that it is more poetic than accurate—admitting that the horse is naturally timid, and that it is through the fear of chastisement and the force of habit that he is brought to brave danger, that is no more than may be said of man himself. There remains still enough to call forth both our admiration and our love.

The form of the fully developed and perfect horse is as beautiful as his movements are graceful. Gentle in his nature, he is susceptible of a high degree of cultivation and improvement. I wish our fast young men could be as readily trained to a lofty pride, to gentleness and good manners.

A good natured wag, fond to extreme passion of the forest chase, by gun and dogs, of which two at least were his constant companions, speaking with impatient indignation of a wealthy man who appreciated neither the hunt nor the hounds, exclaimed, "He don't hunt, and he cares nothing for dogs—I wonder what he wants to live for?"

It would be difficult to conceive what a man *ought* to live for, if he were incapable of the perception of grace and beauty as exhibited and exemplified in a perfectly formed and well trained horse.

The qualities of the horse are exceeded only by his usefulness as a servant of man. What would the world have been without him?

What progress antecedent to the uses of steam and the electric fluid would it have made in agriculture, in trade and commerce, in civilization and refinement, in government and even the forms of religion?

How many battles have been gained through his instrumentality? And how many of these battles have decided the fortunes, and determined ultimately, even the character of nations?

The christian religion, not long since, came near being trampled out and extinguished by the hoofs of Turkish and Arabian horses.

How often has political liberty been dependent upon the gallant bearing and muscular energy of this noble animal? What amount of good has been evolved from the debris of despotisms overturned through his means?

How slow would have been the diffusion and progress of our race, but for the aid which the horse, and his cousin germain, the ass, has lent to travel, to adventure and to discovery! What a mousing and unenterprising creature man would have been, left with no means of locomotion but his feet!

What would be the present state of agriculture had man always been without the horse?

Where would have been some of the refined enjoyments of social life,

had we been always obliged to transport our wives and sweethearts to watering places and genial gatherings, by cart and oxen ?

The horse, in short, has given to war half its power and efficiency, as well as its tenors, and aided in giving to freedom its security, and to civilization its achievements.

I am not sure that there ought not to be a horse college, endowed by the State, where the horse could be indoctrinated in the morals and physics, which would render him of the highest value, and set off, to the best advantage, his natural beauties and graces, and where he could have bestowed upon him, his bachelor's or master's diploma, according to the proficiency which he may have made. When he should come out thence, his education finished, I will venture to say he would make a better figure in the world than many a man has done after emerging from his Alma-Mater, of whom he is won't to talk so much, and by whom he has profited so little.

An animal so serviceable as the horse, so gentle in his nature, and so dependent, demands from man the kindest usage, and the most assiduous care. Yet how frequently is this devoted and faithful servant abused. Excessive labors and overtaxed powers, cruelties by exposure and by brutal violence, have shortened the average duration of the poor creature's life, from thirty year's to fifteen. Care and good treatment, I am persuaded, would give to his owner thirty years of usefulness.

Docking, pricking, cropping the ears, shaving the hair from the mane, tail, ears and legs, are all forms of brutal cruelty, and absurd and pernicious as they are cruel. The practice might have some apology in an ignorant and barbarous age, but is wholly inexcusable in this. And it is as silly as it is barbarous. It assumes that nature made a mistake in the formation of the horse ; and that man, wiser than nature, knows best what a horse should be. When will people learn that the least mutilation of a limb, weakens the horse's system and diminishes his ability ? And as to hair, it is at once an ornament and a necessary protection. A horse has not a single hair which does not subserve some useful purpose.

Strange errors are often committed in matching horses. A man, for example, explores the country for an hundred miles in circuit, in search of a horse, to match one he already owns ; and he imagines he has got a good match when he has found one of merely like size and color. No such thing ; he has only spoiled both. They are dissimilar in the qualities which constitute a match, as much as would be a baboon and a goat, or the deepest dyed Ethiopian skin, and the fairest Circassian. And by uniting them together in service, he diminishes their value instead of increasing it, since each will be forced into the vices of the other. Let horses be selected in reference to their qualities, not their color, and they will be well matched.

Are we not falling into another error ? We import and breed horses in reference to blood and speed. Why not in reference to weight and strength also ? Is there not danger that in our eagerness, I had almost said mania,

for blood and speed, we shall neglect size and strength, and come at last to have a feeble and inefficient race of horses for the draft.

Even now we have no horses which can be compared with some of the European. They are as pigmies to giants. A horse of the Flanders breed will haul a load which would amaze our farmers and cartmen. A single one is capable of drawing, on a cart, a weight which a span of our best horses could scarcely move an inch. He is not, however, a good roadster; but for the draft he is invaluable. Would not the interest of the country be promoted by propagating this breed of horses among us—or, at least, breeding our present stock for strength, instead of speed?

S. K. STOW, *Chairman*.

CLASS 2, No. 19.—HORSES FOR ALL WORK.

The number of entries thirty-six. Twenty-nine horses shown.

The committee experienced much difficulty in making the awards, there being a number of animals of seemingly equal merit. They were further embarrassed by the reluctance of exhibitors to show their horses, either under the saddle or in harness. It is an onerous task to judge rightly of the qualities of a horse, even after a critical examination of his points, and he has been ridden or driven around the small enclosure allotted in exhibitions of this kind; but when he is led on to the ground with a halter or bridle, encased in a blanket or hood, which are not removed, and his owner declines to move him, it requires more talent than the committee possess to divine his claims to even a volume of Youatt.

The committee, with due deference, recommend that a rule be adopted by the society requiring exhibitors to show their horses either under the saddle or in harness. The display of horses of all work entered for exhibition was creditable to the society and the State, and this was the general opinion of those present at the exhibition.

Among the horses entered for exhibition only, the committee noticed with pleasure "Toronto Chief," a bay horse, nearly sixteen hands high, of great strength and speed, and the committee was gratified to learn that he is to be retained in the State for breeding purposes.

W. B. DINSMORE, N. Y., *Chairman*.

CLASS 6, No. 59.—REPORT ON DOMESTIC MANUFACTURES.

Domestic Manufactures!—Words of deep significance to all those who look for the true sources of American prosperity. Domestic Manufactures! How distinctly, as I utter the words, do the scenes and the actors of a past generation rise before us. The old farm house, with its low eaves, projecting porch, ample door-way, and capacious chimney, emblems of thrift and comfort, indicative of the warm, whole-hearted hospitality that reigned within; the square room, with its nicely sanded floor and snowy drapery, and the corner cupboard, where the silver spoons and flowered tea-set were displayed to the best advantage, the kitchen, the dear old kitchen, with its deep fire-place, blazing with logs of beach and maple, that sent a generous

warmth all through the room, drowning, in waves of ruddy light, lamp and candle, and dashing its golden spray over the cupboard and dresser, resplendent with the housewife's store of burnished pewter and tin.

Here the mothers of this generation performed their household labors; here they spun and wove from flax and wool, clothing for the family, covering for the bed, spreads for the table, mats and rugs for the floor. Here were taught those lessons of industry, frugality and modest self-reliance, which enabled the female members of the family to render efficient aid in those struggles by which the wilderness was made to blossom, and the tree of liberty to yield its immortal fruitage.

Honor to the women who follow the customs, preserve the habits, and perpetuate the virtues of those noble ancestors! Honor to the women whose hands are familiar with the distaff and the shuttle—whose sphere is home, whose crowning charm the faithful performance of the household duties.

That many of the women of New York are entitled to this high distinction, the quantity, quality and variety of their handiwork, which have graced these grounds, and given additional interest to the exhibition fully prove. That the number thus indicated is not larger, is much to be regretted. That the practice of supplying the wants of the family by the labor of its members, has been to so large an extent abandoned, is matter for serious concern. No reduction in prices, occasioned by substituting steam for nerve power, brass and iron for human muscle in the manufacture of these products of the loom and needle, can compensate for that want of vigor of body, evenness of temper, and strength of mind, which characterizes a large portion of the female representatives of Young America. No pecuniary gain can compensate for the growth of those sentiments which find expression in women's rights meetings, spiritual circles, and free-love conventions.

A corrective may be found to these evils by returning, so far as the present condition of the arts will possibly permit, to the habits and the employments of our ancestors.

Rebuild the old kitchen, replace the old broad hearth and blazing fire, restore the spinning wheel, set up the loom, bring out the quilting-frames, let the sound of old fashioned industry be heard in the dwelling, and old fashioned amusements fill the pauses and cheer the heart of labor.

Then the golden tide that sets across the Atlantic to enrich the workmen and artists of Birmingham and Brussels, of London and Paris, will be checked, and henceforth flow in the home channels, to reward and bless American industry. Then women, instead of joining the giddy worshippers of fashion; instead of claiming rights which God has denied, will occupy her legitimate throne, and reign by Right Divine, mistress of the family and the household. Then health will display upon the cheek its crimson banner, and marshal all the graces beneath its radiant folds; then love will crown her with perennial flowers, and friendship embalm her memory with fragrant odors in the hearts of many generations.

L. CHANDLER BALL, *Chairman.*

SUGGESTIONS ON BEE CULTURE.

What is desirable in a bee-hive?

It has long since been ascertained that a colony of bees, in nearly all localities in good seasons, will store more honey than is needed for a supply of food in winter. This will be done whenever the colony is strong and their department is of suitable size, whether it be in the form of a square box, basket of straw, flour barrel, section of a hollow tree, or even a cavity in the rocks. Whoever asserts that any one of these, because of its shape, will ensure a greater quantity of products is quite likely to be blinded as to facts, or actuated by interested motives. It has been satisfactorily proved, within the last half century, that only one apartment is not the most profitable way of keeping our bees. We must sacrifice their lives to secure their stores. It often occurs, when properly managed, that the surplus over winter stores is of more value than the whole contents when the bees are destroyed. There is also another gain of equal value in saving the colony as a winter stock. Hence the necessity of separating the surplus from the winter stores, so that it may be removed without injury to the bees. It has been found that whenever bees are forced into another apartment for room for storing, there is a little loss of time, they are reluctant about beginning. If the surplus is stored in the apartment where the brood is raised, or in separate boxes too easy of access from the main hive, there is liability of having eggs deposited by the queen in the combs previous to filling them with honey, which renders them dark and tough, and also to have an occasional cell filled with bee-bread. If boxes are too remote, or access to them is only by very small holes, or too few of them, the bees are unprofitably tardy in commencing in them. These extremes should be avoided. All these advantages can be obtained with a simple board box or boxes. The surplus can be obtained in its utmost purity by merely having one apartment for rearing brood, and another directly above for surplus. And here again extremes must be avoided, the proportions should be right. In the eagerness to obtain great results in surplus, the apartment for brood and winter stores has often been made too small, compelling the bees to put the stores needed for winter in an outside box, and using the breeding apartment almost exclusively for brood. This is usually very satisfactory to beginners, from the large quantity of surplus obtained the first season; but as the bees begin the winter among the brood combs where there can be but little honey, it is often exhausted during cold weather, and they are unable to leave this apartment to go to some other for a supply, and must starve in consequence. This has been the fate of too many. Consequently, it has suggested the idea of ascertaining, by actual experiment, what size will answer for all purposes, for brood and winter stores. Apiarians are pretty well agreed that for all places south of forty degrees a square foot (1728) is large enough. Two or three degrees further north require some 2000 inches.

The many variations of hives to obtain the surplus honey has resulted in, or proved, the fact that there is nothing gained over the simple square

box, for either quantity or quality. Hence the square box should be taken as a model or standard, when other points are to be secured, and this retained of full size.

Another difficulty. Each young bee is reared in a cell but little larger than itself; before it takes the mature form, it lines its cell with a thin coating of silk, which is not removed after the bee leaves it; it is evident, therefore, that enough may be made, one inside the other, to reduce the size till too small for the young bee, when it is important to remove the old combs and let the bees construct new. *This* has given rise to a great variety of hives, contrived expressly to accomplish this object with facility. This is very well, when the arrangement does not interfere with other more *important* points, and the cost of construction does not cost more than the convenience is worth. On this point, the public have been very much abused; but few have the necessary experience to decide for themselves. After an experience of more than a quarter of a century, we are satisfied that less than one per cent ever lasted long enough to make a change of combs necessary. Yet more money has been expended on this point, and more positive evil been done to bee culture, with less good to balance, than all other contrivances about them. Combs once used for brood, are not fit for much else afterwards, except a little wax, and may be used ten years without any disadvantage. They cannot be made without expending time to construct, and honey to unite the material. Few persons count the cost. They do not realize that every time the bees are compelled to fill the hive with combs that they might, in that time, if possessed of the old ones, store twenty-five pounds of the purest surplus. Another great objection to this class of hive is in its being sectional: two or three apartments intended for rearing brood, the bees lose time going from one to the other; they are liable to starve in winter, and furnish the surplus, or a portion of it, in impure combs. Any one who really understands his real wants will not probably desire a hive of this class.

The wax moth is continually about our bees in warm weather, often causing serious injury. This is another fruitful field of useless contrivance by those who understand but little of the real nature of them. It is a fact well understood by those who have the most experience, that there is no safety for combs in *any* hive without a colony of bees to defend them! Such persons as are generally interested in recommending a moth-proof hive, seem to be ignorant of the fact that the moth can go where a bee can, and that the eggs sometimes go where the moth cannot, as is shown by their hatching in the midst of the bees. A trap for catching the worms is commendable when the expenses for the purpose do not overbalance the advantages. These may be efficacious, and yet be varied much in arrangement.

The simple box hive, made of rough boards, will answer every purpose for profit with the best enumerated; yet there are many things very desirable to add to this, viz: The apiarian wishes sometimes to limit his swarms to one from each stock. To make artificial swarms when they do

not regularly issue. To ascertain at once when a queen is lost. To prevent rearing too many drones. To equalize winter stores—taking from those having an over supply, and giving to such as are deficient. To be able to dislodge the moth worm at any time from the combs, when he has effected a lodgment, and likely to injure the bees before they can do it themselves. To changing combs when necessary, &c., &c.

The moveable comb hive is the first step towards giving us these desirable qualities, yet there is much about them very imperfect, thereby opening a large field for improvement. The bees do *not always* follow the guides and make the combs straight; this makes it impossible, in extreme cases, to lift out the combs. The bees do not always keep sufficiently quiet to prevent nervousness in some operators. The smoke recommended is not always efficient. The sugar water, for the same purpose, takes much time, and is not effectual to prevent stings when the hive is first opened. Yet, what has been accomplished, indicates what may be gained in this direction towards perfecting the bee hive—a perfect one is not expected—there is room for much improvement.

Let the idea that bees will collect more stores in one shaped hive than another (providing extremes are avoided), be discarded.

All divisions in the breeding apartment and winter stores should be rejected as injurious, if not fatal, in cold weather.

The surplus honey. What shall be the standard?

Shall the box or quality of honey decide, or both? There are, in reality, but two qualities of honey, readily detected by most persons—the clover and the buckwheat. On the *appearance* of this, much of its *market* value depends; it is much affected by the style of box in which it is stored. A common water pail has been suggested and used to some extent, and has the advantage of being useful after the honey is out, to recommend it. Also, a round wood box with cover, and large stone or glass jars have been used, and utility would seem to sanction their use; but when offered in market, in contrast with the same quality, in square glass boxes, the much better appearance the latter presents, sells it at a much higher figure, and boxes at the same rate. All extensive producers furnish honey for market. If the highest price is commanded by that of the *best* appearing, the producer should know it. The flavor is never questioned in market; it is presumed that is right, if it is from a northern climate. Here is a field open for competition—the *best appearance*. The bees can be controlled in the manner they work, but not in the flavor they give the honey; therefore, when a premium is awarded, it should be when it can, for what another may imitate. It is unnecessary to require a statement of the kind of hive used—because, as already shown, it can have no influence on the flavor or shape of combs.

Whenever a premium is awarded, it would be well to ascertain the treatment of the bees; whether one or more swarms were hived together forming the colony that stored it. How long the boxes were on the hive.

What flowers were in bloom while they were being filled. Whether guide combs were used in the boxes, &c., &c. M. Q.

BEE CULTURE PROFITABLE.

BALLSTON, N. Y., December 8, 1859.

Col. B. P. JOHNSON:

Dear Sir—I take the liberty to send to you a copy of my account with my bees for the current season. The profits foot up, as you will see, to something *over one hundred per cent* above every expense. I can make no other stock pay half as well. I have charged them no ground rents, as they hang on cleats, and I get a full crop of grass under them. Experience is continually improving my skill in their management. I have just learned that much may be gained in amount of honey in boxes by changing boxes partly filled from industrious swarms to more idle ones, even without emptying the boxes of the bees, as I find they do not quarrel. Another improvement is to put empty comb into each box before inserting it in the chamber. Some stragglers finding empty cells will put a little honey into them, and a beginning being thus made, the process of filling is soon undertaken in earnest.

I shall sell a few more swarms, as I find that from twenty-five to thirty is about the right number for me to winter.

1859.

Dr.

June 1. To 29 swarms wintered, worth \$7 each,.....	\$203 00
To 30 hives for new swarms, \$1.50,.....	45 00
To 100 honey boxes, 18c,	18 00
To 13 frames on which hives are suspended, 50c,.....	6 50
To labor bestowed, estimated at	10 00
Expense of marketing,.....	3 46
	<hr/>
	\$285. 96
By sales of 520½ lbs. clover honey, including boxes, 25c,	\$180 12
" " 489 " buckwheat " " 14c,	68 46
Seven swarms taken up:	
By honey estimated at \$3.00 each,	\$21 00
By seven hives for use again, \$1.50,..	10 00
	<hr/>
	31 50
By honey on hand and used in family, estimated,	30 00
By 35 swarms on hand, \$6.00,	210 00
By 17 swarms sold after honey season,.....	100 00
By first premium at State Fair,.....	5 00
" " Saratoga Co. Fair,	1 00
	<hr/>
	\$576 08
Deduct debits,	285 96
	<hr/>
Profits,.....	\$290 12
	<hr/>

HIRAM BULKELEY.

Mr. Bulkeley was awarded first premium for best sample of honey coming within the rules of the society. It was a very choice sample, and worthy of the award given by the committee.

PROPAGATING STRAWBERRIES.

Whenever I wish to make a new strawberry bed, I allow the old bed to run into a mass. Then, at any time during the autumn or early spring, I line strips about seven inches wide and twenty inches apart through the length of it, and cut them into squares. These squares I take up with a spade, about three inches deep, and set them eighteen inches apart in furrows previously made two feet apart in a new bed. As the roots are not disturbed, they bear a full crop the first season, and this pays well for the heavy labor of removing so much earth. I make no account of the large number of roots required, since they spread so rapidly as to cover the ground in a single season, even when runners are kept back till after fruiting. The trenches made in the old bed are filled with rich earth and manure, and the bed is soon covered with plants again, when other trenches may be made and filled, thus renewing the whole bed by degrees, as occasion requires.

HIRAM W. BULKELEY.

MEDITERRANEAN WHEAT.—STATEMENT CROP.

LENOX, MADISON COUNTY, September 29, 1859.

Mr. B. P. JOHNSON, *Secretary, &c.*:

Dear Sir—In compliance with your request, we forward you the enclosed specimen of Mediterranean wheat. We harvested in July last, 186 bu. from five acres, it being thirty-seven bu. six quarts and one pint, per acre, nearly. It was estimated that the best acre in the piece would yield 42 bushels; two acres of the field, the previous year, (1858,) was summer fallow, and of the other three acres, about one-half was sowed with peas, and the other half was planted with early potatoes of the variety called *Mountain June*. The potatoes were dug and marketed in July and August, and sold for at least \$75, probably some more. Had the peas been sold, their price would have increased the sum to over \$100. The pea and potato ground was plowed but once in the fall, to fit it for wheat, and the fallow was plowed three times during the summer. About 80 large loads of barn-yard manure were put on the field, or about sixteen loads per acre. It was put on the potatoe ground in the spring, and on the pea-ground and fallow in the fall, or perhaps in August. The wheat was sowed the third of September, and was harrowed twice after sowing.

Very respectfully yours, &c.,

HORACE H. HALL,
ROBERT KIRKLAND.

RULOFSON & HARVEY'S STRAIGHT DRAFT PLOW.

The beam can be adjusted so as to take a wide or narrow furrow, or for two or three horses abreast, and still retain a straight or parallel draft. It is the opinion of farmers who have tested it, that the arrangement of the beam is right for the following reasons: First, the ease with which the plowman can hold it; second, the ease with which it is changed from a two to a three horse plow, besides other valuable points. Price of plow, with wheel and clevis, \$9.00. Full rigged, with pointer plow, \$12.00

RULOFSON & HARVEY, *Penn Yan, N. Y.*

REPORT.

A special committee, of which Ira Jagger, of Albany, was chairman, examined and reported, at the request of the Executive Committee, on the following articles :

In Class 7.—A knitting machine by George P. Jackson, Cohoes, a very superior article, works nicely, simple in its construction, durable and easily managed and repaired.

Rotary Dynamometer and Register, for measuring and registering power. Neer's patent.—Exhibited by Thomas Potter, Glens Falls. This machinery appears to possess all the facilities for measuring and registering power, an article which has long been wanted by those letting out or hiring power. The machines are built to register from one to 150 horse power. We consider it a very excellent machine.

Class 4. D. A. Woodbury, Rochester.—Steam engine well got up for this style of engine, and sold at the low price of \$75 ; the horse power with boilers all complete.

Erickson's Caloric Engines.—One of two, and one of five horse power, exhibited by Messrs. Clute, Schenectady. Seventy-five of these engines have been built at their works the past year ; and over two hundred of these engines have been put in operation the past year, which argues well for the success of these machines.

Portable Steam Engines, built and exhibited by Messrs. Wood and Hurlburt, of Utica, performed well, and have an excellent furnace arrangement, rendering them safe as regards the danger from fire, and in all respects good engines for light purposes.

A Model of a Thrasher and Separator, by C. B. Welford, of Fredericksburg, Va., seems to be simple in construction, and the committee consider it as possessing considerable merit. IRA JAGGER, *Chairman.*

M. P. COONS, BROOKLYN, PATENT GAS GENERATOR.

Exhibited by Mr. James Condon, of Albany, N. Y.

The generator and the required apparatus was in practical operation when the committee called to examine it. After having examined the mechanical structure and internal arrangement of the apparatus in its combination, the retorts were charged with materials for generating gas, which consisted of two pieces of soft maple wood, and some pound or two of refuse fatty matter which appeared to have been gathered from a restaurant or family table ; the entire expense of which could not have exceeded (including the fuel) more than eight or ten cents, from which some fifty or sixty feet of pure and a brilliant illuminating gas was generated, without emitting the least odor or scent of any kind whatever, and the same fuel then in a state of combustion would have been amply sufficient to generate double the quantity if the charges were successively continued.

This apparatus appears to be arranged upon strictly scientific principles, and is in its entire construction, arrangement and operation, extremely simple, as any person of ordinary intellect can operate it. No complicated machinery

liable to get out of order; and also quite durable, needing no repairs in a series of years, and entirely safe from explosions.

The committee consider this invention of great importance to the public at large, as it is adapted to all parts of the world where combustible materials are found, not being confined to any particular material, wood, coal, rosin, vegetable or animal, &c.

The arrangement admits of any capacity, generating from 100 to 1000 feet per hour, and may be placed in any dwelling in the country or city, in churches, seminaries of learning, public buildings, and, if extended, it may be used for illuminating villages and cities.

The committee consider this invention as one of the most important improvements in apparatus for illumination, &c., now known to them.

PETER PHILLIPS,
GROVE BRADLEY.

KIRBY'S AMERICAN HARVESTER—A COMBINED MOWER AND REAPER.

This machine was first prominently brought before the public at the great trial of mowers and reapers at Syracuse, in 1857. It received at that trial the silver medal awarded to combined machines.

Its success since then has been such that its strongest competitors must acknowledge could only be the result of well earned merit. Its peculiarities are, that it is almost wholly of iron, which insures durability; the finger-bar has an action independent of the driving wheel, which enables each, independent of the other, to follow the inequalities of the ground over which they pass, while in reaping, the bar is rigid and can be elevated or depressed from two to eighteen inches. The driver, in mowing, sits upon a lever by which he, by his weight, takes all weight from the horses' necks, and also lifts the weight of the frame and finger-bar from the ground, throwing the whole weight of the machine and his own upon the driving wheel, thus making the driving wheel take a strong hold upon the ground, carrying the whole weight directly on the wheel, and giving the driver an easy and convenient seat. At his right hand he has two levers, one of which throws the machine in and out of gear, and the other, by an easy and convenient motion, lifts one or both ends of the finger-bar.

The position of the raker in reaping, which in all machines is the most laborious work to be done, is very convenient, and is probably the easiest one in which he can be placed. This harvester has another feature, we believe, only used on the Kirby, and which, the proprietors inform us, is secured to them by a patent, that is a revolving track cleaner for separating the cut from the uncut straw.

The ordinary swathing board is very liable to leave the cut grass lying in bunches, so much so, that in heavy grass, it is often necessary to spread it after the machine. We are told by those who have seen the "revolver" in operation, that it leaves the grass spread evenly and runs much easier than the old pattern.

These machines are largely manufactured by D. M. Osborne & Co., at Auburn, N. Y., and Baltimore, Md., and can be had from their factories, or from their agencies at 107 Lake st., Chicago, Ill.; Plant & Bro., St. Louis, and of their local agents in all parts of the country. They are also manufactured by Buffalo Agricultural Machine Works, Buffalo; and A. S. Clark, Bellows Falls, Vt.

DESCRIPTION OF WALTER A. WOOD'S IMPROVED MOWER.

PATENTED FEBRUARY 22, 1858.

I build two-horse and one-horse machines. The two-horse machine weighs 514 pounds, has two driving wheels, which are placed thirty inches apart; each wheel is twenty-eight inches in diameter. The gearing rests upon a frame, which is supported on the axle between the drive wheels. The finger bar, to which the fingers are bolted, is elastic, is made of cold rolled Swedish iron, three-eighths of an inch in thickness, equal in strength and elasticity to steel and less liable to break. It is attached to a shoe which swings upon the axle, and can be easily removed by taking off one nut; and when placed upon the frame, under the seat, the machine can be driven from field to field as easily as a light cart. The seat for the driver is fastened to two standards, which rest in a socket iron, through which the axle passes, the tongue being bolted firmly to the front end of the iron, which also serves as a fulcrum, over which to raise the shoe and cutters to any desired height in passing over obstructions, by means of a lever immediately in front of the driver.

The knife is driven by a crank pin, projecting from a well adjusted balance wheel, which gives it a steady, uniform motion; it has a rapid motion, with a short stroke, which enables the machine to do good work when the team moves as slow as horses or oxen can walk. The machine can be easily and instantly thrown out of gear, thereby giving motion to the driving wheels only, when moving, and cuts a swath four feet wide. The one-horse machine is constructed on the same plan, and in the same manner, in all respects, as the two-horse machine, except that it has shafts instead of a pole, weighs fifty pounds less, (464 pounds,) and cuts a swath three and a half feet wide.

The machine is warranted capable of cutting ten acres of grass per day, in a workmanlike manner.

Price of two-horse machine, \$80. Price of one-horse machine, \$70.

WALTER A. WOOD,

Manufacturer and Proprietor,

Hoosick Falls, N. Y.

THE POLAR REFRIGERATOR.

Patented by A. H. Bartlett, November 23, 1858.

This refrigerator is constructed upon truly scientific principles. The ice receptacle is made in a wedge form of corrugated zinc; and it is placed in the middle of the box, and forms two separate and distinct provision cham-

bers; either one of them, it is claimed, is as effective and convenient as the whole of any other in use. The ice is placed in the upper section of this receptacle upon a strong rack; immediately beneath the rack is a filter, through which the ice-water streams as it melts, falling into the lower angle, where it is retained for its frigerific properties; or to be drawn off, with fresh water added, for drinking or culinary purposes; an overflow pipe is arranged so that the water cannot by any contingency reach the ice. It is self-ventilating, and no one article of food will impart its flavor to another. But its greatest feature is the manner and the certainty by which the moisture is taken from in and around the provisions. This is done by leaving exposed to the provision chambers and corrugated sides of the ice and ice water receptacle, whereon all moisture is immediately condensed and carried off through the waste-pipe. It is well known that provisions will keep better out than in most refrigerators; the reason for this is obvious. The moisture in the air (finding nothing colder than itself) is deposited upon the provisions, then causing them to become mouldy and musty.

The cut shows a perspective view of this refrigerator, with the right-hand portion of the front broken away, to show the internal construction. J, outer box; h, inner box; o, o, charcoal dust; c, ice-water reservoir; D, ice; M, ice door; K, ventilator; E, E, openings to admit the air into the provision chambers; L, opening for the exit of the air, drip from the ice and condensation; V, faucet for drawing off the ice-water. The whole internal portion is lined with zinc.

Manufactured by

BARTLETT & LESLEY,

New York.

EXTRACTS FROM REPORTS—ANNUAL MEETING.

W. P. OTTLEY'S EXPERIMENT WITH FERTILIZERS UPON INDIAN CORN, AS DIRECTED IN NO. 2, PREMIUM LIST.

The plot or field upon which I made the experiment, was a part of a field that was manured with twenty loads of barn-yard manure to the acre, and planted to corn five years ago. The next season sown with barley; the fall following sown with wheat, and seeded to clover the following spring, and has lain in clover two years—the first used as meadow, the second as pasture. The portion of the field used for the experiment, was as near alike as possible, perhaps as much so as could be selected in any situation. It was thoroughly underdrained; the soil was a gravelly loam, very much alike. I chose a portion lying or sloping to the east. Each plot was two rods in width and twenty long, marked for planting three feet four inches each way, which gave ten rows in width and one hundred in length, which gave one thousand hills to each quarter acre. The plowing was done with a turf plow, seven inches deep, harrowed well, and planted, May 31, with the yellow red blaze variety, five or six kernels in a hill. It appeared above ground, June 7th. I applied the allotted fertilizers to numbers two, three, four, five and six, at planting. The barn-yard manures were plowed in; the remaining applications were applied June 12th. The mode of applying the several fertilizers were as follows:

- No. 1. Without manure.
2. Peruvian guano, 100 lbs., sown broadcast upon the furrow.
3. American guano, 100 lbs., (I could not get Mexican,) was sown as No. 2.
4. Commercial superphosphate of lime, 100 lbs. was applied in the hill, covered with earth at planting.
5. Poudrette, one barrel in the hill, as No. 4.
6. Tafue, 100 lbs. in the hill, as No. 4.
7. Gypsum, 100 lbs. top of hill when up.
8. Unleached ashes, 100 lbs., as No. 7.
9. Four tons barn-yard manure plowed in.
10. One hundred lbs. Peruvian guano, 100 lbs. superphosphate of lime, 100 lbs. of unleached ashes, 50 lbs. gypsum upon the hill when up.
11. Without manure.

No. 12. Decomposed barn-yard manure, four loads plowed in.

13. Barn-yard manure, five loads plowed in, top dressed with 100 lbs. of equal parts of gypsum, leached ashes, and one-fifth part of hen manure, one-tenth of salt applied on top hill.

14. One hundred lbs. of the above mixture on top hill.

I did not perceive any difference in its appearance when first up, except in numbers four, five and six, which were a little tardy, say twenty-four hours.

I commenced cultivating the experiment corn, June 15th; it was cultivated twice in a row each way, and let it remain about one week, then run the cultivator twice in a row and hoed it; let it remain about a week, then run the corn plow each way, and hoed the second or last time. I made observations July 1st. No. 1 had a languid appearance, the color rather yellowish, and not as tall as No. 2. No. 2 was better than No. 3 in its size and color. Nos. 4, 5 and 6, had the same appearance to each other of a good color, but inclined to be spindling and uneven. No. 7 was very poor, not as good as No. 1. No. 8 had the same appearance of No. 2. No. 9 was uneven in its growth, and had a yellow look. No. 10 looked much better than either of the other numbers, in color, even in its growth, size, &c. No. 11 had the same appearance of No. 1. No. 12 looked about the same as No. 9. No. 13 looked about the same as No. 10. No. 14 did not look as well as No. 13, but about the same as No. 8. I made observations again August 1st. The contrast was about the same as when I observed them on the first of July. The season being a cold one, it had grown very slow. On the first of September I again looked them over; I found that No. 1 and No. 11 were showing signs of maturing more than either of the other numbers.

I frequently noticed the marked difference between the several numbers. A stranger, in crossing them, could readily point out the several lines. I also noticed that No. 9, with barn-yard manure, did not seem to derive any nourishment from its manure, till about the 15th of August, when I could perceive a change. It is evident that when our barn-yard manures are applied and plowed in for corn, we do not get an immediate benefit. It is evident that our corn crop most needs its stimulants while in its first stages; it is also highly important that it should be of that nature that the young plants can derive its present want. The corn was cut up the first week in October, and husked the last week in November. The several amounts of bushels of ears and bushels in weight, shelled, and number of bundles of stalks, together with the cost of each fertilizer, are shown in the following table. There was a perceptible difference in each quality of corn, before and after being shelled, some being more fully mature.

Table, showing the several amounts in bushels of ears; also shelled weight, and the number of bundles of stalks upon each plot, and the cost of the several fertilizers at my place.

No.		Ears.	Shelled weight.		Stalks.	Cost fertilizers.
			Bus.	Lbs.		
1,	.....	28½	13	41	78	
2,	.....	29½	14	12	78	\$3 25
3,	.....	29½	13	39	77	2 25
4,	.....	29	13	26	77	2 50
5,	.....	28	13	..	75	2 25
6,	.....	29	13	55	70	2 00
7,	.....	32½	15	5	74	0 25
8,	.....	31	14	6	78	0 25
9,	.....	32½	15	21	74	2 50
10,	.....	38½	18	12	82	6 13
11,	.....	29	12	53	77	....
12,	.....	34½	16	39	77	3 00
13,	.....	39½	20	44	75	3 50
14,	.....	35½	16	31	71	1 00

W. P. OTTLEY.

Dated PHELPS, February 1st, 1860.

SPRING WHEAT.

CHARLES W. EELLS, WESTMORELAND, ONEIDA CO.

*Yield per acre, 34 bush. 48 lbs.**Statement of the Method of Cultivation, Expense, &c.*

The previous crop was corn, on green sward plowed seven inches deep and eleven wide, manured at the rate of twenty loads coarse manure per acre, plowed in. The corn was a good crop; I should think would yield seventy-five bushels per acre. The soil is a gravelly loam, in good condition. The farm is located in the town of Westmoreland, Oneida county, on an elevation, one mile north of Hamilton College. The surface of the farm is rolling, and a little descending to the east. There was no manure applied to the wheat crop, but I think that one-half the value of the manure used on the corn should be charged to the wheat crop. The corn stubble was plowed eight inches deep and eleven wide, April 25th; harrowed both ways, and sowed the 27th, with grain drill in rows seven inches apart, covered two inches deep, at the rate of one and a half bushels per acre, and rolled with a heavy roller. The variety is called *Tea* wheat, which is considered the best in this county; it yields well, and makes good flour as any variety of red winter wheat. The wheat was cradled August 8th; bound and set up in stooks the next day. Stood in the stook two days before carting to the barn. Thrashed with a machine Sept. 3d; cleaned in a good fanning mill. The actual yield by weight was sixty-eight bushels and forty-eight pounds, weighing sixty-four pounds per bushel, measured in a sealed half bushel. The wheat is not sold, but reserved for family use and seed; is very plump and clean, free from oats and all foul seeds; worth at least 12s per bushel.

Expense of crop, harvesting, &c., and rent on land, \$40.88.

By 68 48-60 bushels wheat, at 12s.,.....	\$103 20
By three tons of straw, sold for.....	15 00
Total value of crop,.....	\$118 20
Total expense,.....	40 88
Profit,.....	\$77 32

CHARLES W. EELLS.

WESTMORELAND, ONEIDA CO., Jan. 24, 1860.

Proof as required by rules of Society.

RYE.

C. L. KIERSTED, KINGSTON, ULSTER CO.

Eight acres, 35-100; 302 36-100 bushels.

In the spring of 1857 broke up the sward, and manured two acres before plowing; one acre in addition was manured with rotten manure after plowing; and on one-half of the lot about 200 bushels of slacked lime to the acre. Planted to corn; the yield, where the manure was used, eighty-seven bushels per acre. The next year sowed oats; the yield on two acres, without additional manure, was 226 bushels.

The soil, a sandy loam, located on Kingston Flats, and, before manuring, in poor condition.

On the crop of rye, about fifteen loads of good, decomposed hog and horse manure to the acre, put on after plowing; sowed $15\frac{1}{2}$ bushels of common rye on the whole field, from the 3d to 8th September. Harvested from 10th to 15th July, and finished cleaning the 17th January, 1860, and the actual yield by weight, at fifty-six pounds to the bushel, was 293 51-56 bushels,=thirty-five and over per acre; by measure, 302 bushels per acre,=thirty-six and over per acre.

Expense of cultivation, including 125 loads of manure, at \$1.50 per load, and interest on land, \$58.40, was \$300 85

By 302 bushels of rye, at eighty-six cents per bushel, . \$259 72

By twenty tons of straw, \$10 per ton, 200 00

459 72

In favor of crop, \$158 87

NOTE.—On that portion of the field where lime was used, the straw was brighter and stiffer, the berry larger and brighter. The portion where no lime had been used was a little affected with rust; the portion limed was free from rust.

C. L. K.

Proof as required.

OATS.

C. L. KIERSTED, KINGSTON.

Two acres, 213 bushels.

Previous crop corn; manured on top after plowing, fifteen loads to the acre, best of horse manure. Soil, loam, in good condition; no manure on

the oat crop. Four bushels of Poland oats for seed per acre ; sowed 10th April, harvested 10th August, thrashed and cleaned, Nov. 8th to 11th ; yield by weight, 6,603 lbs., or 206 11-32 bushels : by measure, 213 bushels ; market price, forty-four cents per bushel.

Expense of culture, including interest on land,.....	\$36 00
By 213 bushels oats, at 44c.,.....	\$93 72
By four tons straw, at \$10,.....	40 00
	<hr/>
	133 72
In favor of crop,.....	\$97 72
	<hr/>

Proof as required.

OATS.

Statement of a crop of oats, and manner of cultivation, &c., raised by Wm. H. Slingerland, Norman's Kill, Albany county, N. Y.

The lot, previous to being plowed up, was a meadow, the previous crop, in 1858, was corn, and previous to being planted with corn was manured before being plowed, about twenty loads of barn-yard manure to the acre, which manure had been drawn out from the barn-yard to the lot in the winter, in piles of about twenty loads on pile, for the purpose of facilitating decomposition, and about the first of May was carted out and spread over the land and plowed in.

The farm is located in Bethlehem, Albany county, N. Y., and is somewhat rolling surface. The soil being a clay loam, and has been under-drained with tile in the lowest places ; previous to being under-drained the crops in the low places were almost an entire failure.

The land was plowed the 11th and 12th of April, 1859, from seven to nine inches deep, and was sowed on the 16th day of the same month with the ordinary kind of oats, three bushels to the acre, and was harrowed once before sowing the same direction as plowed, then twice harrowed over diagonally after having been sowed, the last harrowing at right angles with the second, with a double Scotch harrow.

There was no manure applied to the land or crop of oats in 1859. We believe in sowing oats as early as practicable in the spring, and would have sowed the above crop still earlier if the land had been sufficiently dry. The crop of oats was about one-half lodged, consequently most of it had to be cut with the grass scythe, and the balance with the cradle, the first week in August, and was left to dry about two days in swath, and was then raked in sheaves and drawn to the barn, and immediately thrashed with the machine, and cleaned through a first rate fanning mill once, and was then drawn to market.

The lot of land contained six acres and thirty-three one hundredths acres, and produced 618½ bushels of oats, weighing 34 pounds to the bushel, equal to 657¼ bushels by weight. I sold the foregoing mentioned crop in the city of Albany, by measure, for forty-two cents per bushel, excepting about forty bushels.

Value of crop.

By 618½ bushels of oats at 42 cts. per bushel,	\$259 77
By value of about 7 tons of straw, the market price of which is \$8 per ton,	56 00
Total value of crop,	315 77
Total expenses,	79 39
Total profits,	<u>\$236 38</u>

Proof as required.

BARLEY STATEMENT.

HIRAM MILLS, MARTINSBURGH, LEWIS COUNTY.

1. Previous crop, peas, sown on green sward without manure ; ground plowed early in September, 1858 ; afterward, cultivated and harrowed.

2. Soil—a clay loam ; subsoil, hard clay.

3. Applied twenty loads cow stable manure to the acre, on the two acres entered for a premium, in the spring of '59 ; spread evenly over the ground before plowing for the crop.

4. Ground plowed on the 9th of May, and the day following sowed two and a half bushels of two-rowed barley per acre, and cultivated and harrowed well and rolled.

Harvested on the 11th of August ; cut with a scythe, and spread on the ground to dry. Next day raked with a revolving horse rake, and drawn from the winrow to the barn.

Threshed on the 12th December, with a machine, and drawn to market the next week. Sold to the miller near by. Yield, 122 9-48 bushels on the two acres of land, or 61 4½-48 bushels to the acre by actual weight. Thirteen acres, in the same field, yielded 660 bushels, or 50 37-48 bushels per acre.

Expenses per acre, including int. on land at \$60 per acre,	\$22 58
Proceeds of barley, 6s. per bushel,	\$44 56
Straw,	10 00
	<u>54 56</u>

Balance per acre,

\$31 98

Proof as required.

HIRAM MILLS.

BUCKWHEAT.

C. L. KIERSTED, KINGSTON.

35½ bushels per acre.

Previous crop, rye—which was badly injured in the winter, and plowed up first of July, and sowed with buckwheat sixth July. The soil sandy loam, in fine order. One bushel seed of common black buckwheat. Harvested and cleaned 25th to 30th September, and the yield by weight was 48 bushels, and by measure 35½ bushels. Market price, 62½ cents per bushel.

Expense and interest on land, \$13; buckwheat, at 5s.,	\$22 18
Four loads straw, 4s.,	2 00
	<u>\$24 18</u>
In favor of crop,	<u>\$11 18</u>

The whole field contained six acres, and gave 202 bushels.
Proof as required.

FLAX.

MERRITT C. SNYDER, PITTSTOWN, RENSSELAER COUNTY.

2 $\frac{18}{100}$ acres. Seed, 30 bushels one quart. Flax, 1,001 lbs.

The previous crop was corn, and manured with twenty-seven wagon loads of manure from barn-yard; the corn crop, previous to the above, was from a green sward, and was partially destroyed by worms.

The soil is a little inclined to gravel and upland. There was no manure used on the grass crop. It was plowed and dragged before the seed was sown, and lightly dragged after sowing. Two bushels of seed were sown on the 28th of April.

Expenses, including cleaning and whipping the seed, dew rotting and dressing, and interest on land, at \$60 per acre, was	\$48 22
30 bushels and one quart, at \$1.50,	\$45 04
1,001 lbs. flax, at 15c.,	150 15
	<u>195 19</u>

Balance in favor of crop,	<u>\$146 97</u>
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Proof as required.

HENRY WEIR.

One acre $\frac{71}{100}$. Seed, 20 $\frac{1}{4}$ bushels. Flax, 636 $\frac{1}{2}$ lbs.

Soil, loam, inclining to slate, upland. Previous crop, corn and beans, and manured with fifteen loads barn-yard manure; previous to corn crop, grass.

There was sown on the flax ground, three bushels slacked lime, three bushels plaster, three bushels of ashes, and two bushels of salt. Ground plowed and dragged before sowing the seed, and lightly dragged afterwards. Crop put in the 30th of April.

Expenses, including cleaning and whipping seed, dew rotting, and interest on land, at \$60 per acre, was	\$42 92
20 $\frac{1}{4}$ bushels seed, 12s.,	\$30 37
636 $\frac{1}{2}$ lbs. flax, 15c.,	95 40
	<u>125 77</u>

In favor of crop,	<u>\$82 85</u>
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HAY.

C. L. KIERSTED, KINGSTON, ULSTER COUNTY.

One acre. Yield, 4 tons, 530 lbs.

The previous crop, no manure applied; but the land was irrigated from springs, where practical. The land was on a side hill; soil, a black, rich, sandy loam; seeded with one bushel of timothy seed, about the middle of September, after it had been harrowed three times. The yield, fit for market, was, by weight, four tons, five hundred and thirty pounds. The market value, when sold, was \$15 per ton.

Avails of crop:

4 tons, 530 lbs. hay,	\$63 97
After math,	8 00
	<hr/>
	\$66 97
The expense of mowing and harvesting,	\$8 83
Interest on land,	7 00
	<hr/>
	15 83
	<hr/>
In favor of crop,	\$51 14
	<hr/>

Proof as required.

IRRIGATION.

This subject, by those owning lands upon side hill, or on a slope, where water can be got upon them, either from springs, or from swampy or marshy lands, or from any other source, should require the utmost attention. As I am well satisfied from repeated experience, that running water let upon land in a proper manner will pay better than a good coat of manure, particularly upon grass land, and it can at times be of benefit to grain crops, but the whole thing requires careful experiments.

I had about four acres of ground, mostly rock, with a soil averaging from six to two inches deep, and many places the rock was bare, laying on a slope, or sloping both ways, with a small stream of water running from a swamp through the lowest part of the lot; the land was in grass, produced about half a ton to the acre. I put upon it manure; it did no good; the grass when wet would grow, but would soon dry up and amount to mostly nothing. I took a team with a strong plow, plowed two furrows in different places so as to take the water from the stream over the highest land and let the water out whenever I desired it, attended to it twice a week, letting off and on in different parts of the lot. The result was about three tons of hay to the acre, cut early, and a large after growth. The next year took the water off, the result was less than half a crop. The year following let the water on again as before, with the same good results.

I also had a piece of land, a coarse gravel, nothing but Johnswort grew upon it; there was a large spring directly above the lot; though the water running, as is mostly the case from springs, in a channel directly across the lot. I went to work as before stated, and drew the water upon

the land; the result was, red top and herd's grass came in and grew so that it lodged.

Last year I mowed from one acre of ground 8,530 lbs. of hay, timothy and white clover, made mostly by irrigation. I took the water from springs of *soft* water; drew it in furrows made with a plow; let the water on the land with a hoe. It should be attended to at least twice a week; the water should never be allowed to become stationary or stagnant. Let the water run in the winter as well as summer. The expense of leading the water, where it can be done by furrow, is scarcely anything—say two dollars per acre.

I am well satisfied that one-half of our slope land could be improved, at least one-half, by irrigation, if properly attended to. The water should be taken off entirely whenever you think the grass is becoming too weak to stand up, for fear it may get down and rot, and soon after the water has been taken from off the grass, it should be cut, or it will dry up and be of less value. I have found from my experience that grasses for fodder or for market, should be cut before it begins to ripen, rust, or dry up, or whenever the lower leaves begin to rust or dry, you should cut as soon as possible, or you will be the loser.

C. L. KIERSTED.

KINGSTON, Dec, 20th, 1859.

MISCELLANEOUS.

T. A. Jebb, Buffalo, Jebb's Patent Telegraph Churn, Dip.

New York State Agricultural Society.

The undersigned having been appointed a committee on Churns, at the winter exhibition of the Society at its annual meeting, report as follows:

Two varieties of churn only were exhibited—"the Air Pressure Churn," by Lapham & Wilson, and "the Telegraph Churn," a recent invention, patented Nov. 15th, 1859, by T. A. Jebb, of Buffalo, N. Y.

Mr. Jebb had provided cream for the purpose of making a practical test of his churn. The proposition was made to divide the cream and decide the comparative merits of the two; but this was declined on the part of the person in charge of the "Air Pressure Churn."

Eight quarts of pure cream, at the temperature of fifty-eight degrees, were placed in the Telegraph churn, and in three minutes and fifteen seconds was converted into beautiful butter. The separation of the butter from the milk appeared to be very perfect, and the butter was of a very rich yellow color, of surpassing excellence for this season of the year.

A second trial of the same quantity was made, and resulted equally satisfactory. The temperature of this was fifty-seven degrees, and the time required to produce and gather the butter, was three minutes and twenty seconds.

At a subsequent trial, only two minutes and fifteen seconds was required to produce butter of superior color and excellence.

The undersigned take great pleasure in saying that in the simplicity of structure, efficient working, and cost of the churn, we have never seen any-

thing of the kind to equal it. It has been subjected to use for a few months only, and at one of the most unfavorable seasons of the year, and yet it has secured the commendations of many of the most intelligent and practical agriculturists and dairymen in the western part of the State.

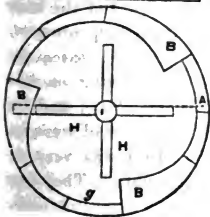
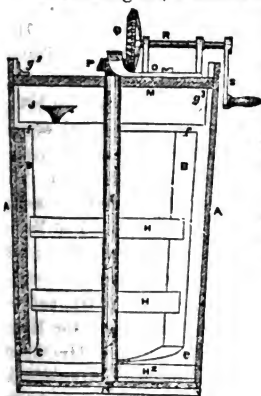
A. P. CUMMINGS,
E. MERRIAM,
SETH MILLER.

Report of the Butter Committee, on Butter made by Jebb's Patent Telegraph Churn.

The undersigned, members of the committee on butter and cheese, take pleasure in referring to a sample of fresh butter made in T. A. Jebb's Telegraph churn, from cream, in two minutes. The butter was well made, was of fine flavor, and in all respects equal in quality to any made at the same season of the year from the dasher churn.

The undersigned believe the churn of Mr. Jebb worthy of the favorable consideration of the public.

M. G. LEONARD, *Rockland co.*
JOSEPH CARY, *Albany.*



WHEAT MIDGE—HESSIAN FLY.

We give the returns we have received in relation to the ravages of the wheat midge, and although but few returns have been sent in, yet they convey important information. We hope to receive hereafter returns from those sections of the State from which no reports have been received. The circular to which these returns are responsive, will be found in the Transactions for 1858, page 290.

Mr. Abram Burlew, of Springport, Cayuga county, states, that in 1846, the midge appeared, and came from the north, though its general course was from the east. It was very destructive the first four or five years. Its ravages have continued more or less ever since. The past season they have done but little damage, owing, *Mr. Burlew* thinks, to the season being favorable for the growth of the wheat, and not for the midge. The Mediterranean wheat has been the least affected of any variety. Barley and clover have been infested by the midge. The only remedy is to sow early varieties of wheat so as to mature early, before the midge appears, and for this purpose, *Mr. Burlew*, after trying many varieties, sows only the Mediterranean, which, he thinks, has improved much by culture. He thinks the loss this year by the midge, is not more than one bushel in fifty, if it is more than one in a hundred. He thinks there are much fewer of the insect than there were four or five years after they made their first appearance.

Mr. A. D. Barber, of East Beekmantown, Clinton county, states that the wheat midge made its first appearance in 1832, destroying on some farms the whole crop; were very destructive for several years; and less wheat sown for a few years. The insect came from the east, and were first seen on the west borders of Lake Champlain. The insect was very destructive in Vermont before they appeared in Clinton county. They have not wholly disappeared at any time.

Previous to 1832, there is no account of the insect in this region. No variety of wheat has escaped, though heavy bearded varieties have been less injured. Crops on dry uplands have not been injured half as much as those on intervals or low lands.

The damage the present season is comparatively light. Several remedies have been tried, but none effectual. No parasite destroying the midge has been seen. An old gentleman from Virginia, says that the midge was very destructive in that State eighty or ninety years ago.

Levi T. Marshall, Vernon, Oneida county, states that the exact time of the appearance of the midge is not recollected, but that the past fifteen years, its ravages have been very severe. The course of the insect has

been from east to west. In the past four or five years, occasional good crops have been grown; the present season a greater yield than has been realized since the insect appeared. The insect, however, has been about, and crops of spring wheat have been badly injured. The Mediterranean wheat has, in many instances, escaped the past season without injury.

The barley crop of 1857 and 1858 is said to have been slightly injured by the insect.

Crops upon uplands generally much less injured than on low lands.

The damage, with the exception of the past season, may safely be set down as one-half the entire crop sown; many remedies have been tried with little success. The most effective is *early sowing* of winter wheat. Spring wheat by *late sowing* escapes, but is liable to blight and rust.

Henry Ellery, Skaneateles, Onondaga county, states that the first appearance of the midge was in 1846, but did little damage at first.

In the fall of 1857, tried some winter wheat, from South Carolina, which answered well by maturing early, escaped the midge and yielded well. Thinks it would be well to renew the seed every two years, from the south. The most destructive season was 1853—the least, 1858 and 1859.

Dry rolling lands, wheat the least injured. The progress of the insect is from the east to the west. The cold weather and frosts in June, and early in July, have had a tendency to check the voracity of the midge.

T. C. Bailey, Albion, Orleans county, states: The midge appeared here in 1853, coming from the north-east; not very destructive first year or two; after one or two years the growing of wheat mostly abandoned. Insect most destructive in 1855, 1856 and 1857; least in 1858 and 1859. Previous to the midge, injury was done to the grain by a short worm, about a quarter of an inch long, not very destructive. This occurred some fifteen years since.

Spring barley has been injured by the insect. The Mediterranean wheat has been the least injured. Grain upon high, sandy soils, much less injured than on low lands. The damage the past season small; crop almost invariably good. Good farmers believe that to raise wheat successfully, we must get *early varieties*, *sow on rich, quick soils*, that the wheat may *ripen before the midge appears*.

Ezra Cornell, Ithaca, Tompkins county, Pres't Co. Agricultural Society: The midge appeared in the north-east part of Tompkins county, so as to attract attention about 1846, and reached the center of the county in 1850. It appears to have come from Cayuga. The ravages of the insect increased from year to year so that wheat cropping was almost abandoned. Very little damage the past year, and the sowing of wheat is increasing. Double sown this fall as compared with 1858. Barley has been somewhat affected. Mediterranean wheat less injured than other varieties. The land on which crops mature early least affected. Gypsum, when used, increases the growth and makes the crop later, and is deemed injurious from that cause.

Job L. Babcock, Yates county, says: Midge noticed about nine years since, came from the north-east. Little injury for a few years, then very destructive. Most destructive in *late*, wet seasons; 1856 the worst season. Barley and clover affected to some extent.

Mediterranean wheat the least injured. Very little damage the past season. The decrease the past six years has been from three to four hundred thousand bushels yearly. Early varieties and early sowing the best remedy. Years ago, wheat was damaged by the Hessian fly, but not within the past ten years.

CAYUGA COUNTY—ABRAM BURLEW.

SPRING PORT, *Sept. 27th*, 1859.

Friend JOHNSON :

I received a circular from one of my neighbors, with a request that I should answer the questions asked therein; I will endeavor to do it, so far as I am capable. In what year? I think in 1846, (although some say they saw it two or three years before;) in that year it was not universal, and did not do a great deal of damage.

I think it came from the north, and I will state some of my reasons. I live in Cayuga county, seven miles south of Cayuga Bridge, on the lake shore, in Conquest, twenty or twenty-five miles north, and through that region it destroyed about all their wheat, for four or five years before it made its appearance here; and when it did come, the first year, it was a great deal more destructive near the lake; it was some two or three years before it got on the other side of the lake in Seneca county, and about the same length of time before it got east to Owasco lake. Nevertheless, I believe, as a general thing, their course is west; I have seen (near sundown) the air, as it were, alive with them, all going straight west. It was very destructive the first four or five years, and I think would have always remained so if we had sown the same kind of wheat, and put it in as we did then; the growing of wheat was never abandoned in this neighborhood, although it was very much lessened.

What has been its history since? I would say that I do not believe there has been a year since its first appearance, that it would not have damaged the wheat badly if the season had been right to have hatched them out when the wheat was just right for them to deposit their eggs. They are an insect that burrow in the ground. I think they leave the wheat the first rain after the wheat is nearly or quite ripe; how deep they go I cannot tell; I have planted corn where I had wheat the year before, and in plowing the corn we have noticed millions of them rise out of the bottom of the furrow and fly away. Whether the ground must be of such a temperature in heat before they hatch out, I cannot say; but certain it is, they must be ready when the wheat is fairly heading out, or they will soon be too late, for the chaff will soon be too hard for them to deposit their eggs. I think they are a short-lived thing, and do all their damage in from four to six days. I do not recollect what year they were the most

destructive, nor the least injurious, except this year; they have done but little damage, for the reason that it was a great deal better season for the wheat to grow, than it was to bring the midge forward in time to do much damage; but that is no proof that next year it will not be a lucky year for them, and bad for wheat. It has not disappeared, at any time. I can recollect back fifty-five years, and there was never anything of the kind before. Barley and clover have been infested with it. There is no kind of wheat that has escaped injury; the Mediterranean has come the nearest to it, for the reason that it matures the earliest. It ought to be the object of every farmer that raises winter wheat, to sow the earliest kind, and do all to his land that he can to make his wheat mature as early as possible. Cropson dry land are always less injured, because they are always the earliest. I do not think that wheat, the past year, has been injured more than one bushel in fifty, if it has more than one in a hundred. I think they have taken one half of the wheat up to this year, sometimes more and sometimes less.

We have not tried any remedies, neither do I believe there is any, unless we undertook to keep them off something as a woman would the flies off her baby's face, (and that would be rather expensive.)

There is no other insect that injures our wheat more than they did fifty years ago. I cannot say whether there is any insect that destroys them or not; it is claimed that the common yellow bird eats them out of the heads of wheat, (and of course would anywhere else,) which I believe to be so.

I have not an idea that there is one midge in this country now, to where there was a hundred three or four years after they first made their appearance here; still I believe there is enough here to damage our wheat very much, providing we sowed the late varieties, and the season should be favorable for them.

Yours, with respect,

ABRAM BURLEW.

P. S.—The wheat midge is a tender insect, and the weather must be just right or they cannot work; it must not be too cool, stormy nor windy, nor the sun too hot. I think they do about all their mischief from the sun an hour high, until dusk in the evening. After all, if they are here when the wheat is just right, they will find a chance to do a great deal of damage; and more depends on having your wheat ahead of them, than anything you can do. We have tried the Golden drop, and a number of other varieties, and dropped them all. My son and myself have sown about fifty acres, all Mediterranean. We think it is a great deal better wheat than when first introduced in this country.

CLINTON COUNTY—A. D. BARBER.

EAST BEEKMANTOWN, Sept. 18, 1859.

Mr. B. P. JOHNSON—Dear Sir: In reply to your circular, I would say,
1. That the wheat midge or weevil made its first appearance here in 1832, destroying, on some farms, the whole crop. They were very destruc-

AG. TRANS.]

tive for several years. There was less wheat sown for a few years; some abandoned sowing for a time, but soon commenced again. The midge or weevil came here from the east. They were first seen on the west border of Lake Champlain. The reason why we think they came from the east is, that they were very destructive in Vermont but a short time before they appeared here.

2. Their history has been a singular one; they have destroyed the wheat on some farms, while that on the next farm adjoining, sowed but two or three days later, would escape them. They have also worked in early and late grain, the same season; while that sowed from the 18th to the 25th of May, would escape them.

3. They have not wholly disappeared in any one year.

4. Before the midge, in thirty-two, I cannot learn, from the oldest inhabitant, that they were ever known in this section of country.

5. No other grain has been infested by this insect.

6. There has no variety escaped their ravages; although wheat that has a heavy beard, has not been injured as much as that with a clean head.

7. The crops on dry uplands have not been injured half as much as those on low lands or intervalles.

8. The damage done by the midge, this year, is light, compared with other years; hardly one-eighth of the crop has been destroyed by them; while other years, one-half has been destroyed. I think one-fourth of the crop has been destroyed by them since thirty-two.

9. The sowing of lime, when the dew was on the heads; some have sowed plaster the same way; some have drawn a rope over the wheat to brush the heads, but no remedy has proved effectual.

10. There has not been any parasite insect that has destroyed the midge.

11. There has not been any damage done by the Hessian fly since the midge made their appearance here. The wire worm, a small yellow worm, half an inch in length, has done much damage some seasons; they work at the root of the grain.

I have learned from an old gentleman, about one hundred years old, who was from Virginia, that the midge was very destructive in that State eighty or ninety years ago.

I send you some of the weevil herewith; it is so late in the season that they are not plenty.

ONEIDA COUNTY, VERNON CENTER—LEVI T. MARSHALL.

1st. I am unable to give the date of the year in which the wheat midge first made its appearance in Oneida county. But it is doubtless sufficient to know that its depredations to the wheat crop, for the past fifteen years or thereabouts, has rendered the cultivation of the crop a profitless undertaking in most localities in this section of the State. Yet there have been some exceptions among the great mass of wheat growers in the results of the crop during this period, from causes not perhaps cor-

rectly understood, such as the kind and condition of soil, the kinds of manure used, the varieties of wheat sown, the time of its ripening, &c.

The insect's migratory course was from east to west, and proved quite destructive to the crop for several years, so much so as to cause the abandonment of cultivating the crop until within the past four or five years, since which time occasional good crops have been realized. And the present season (1859) indicates a greater yield of wheat than has been realized since the first appearance of the *midge*, and in fact equal to that of any former year. Yet the insect this season has been among us and destroyed many crops of spring wheat, from *fifty* to *sixty* per cent, while crops of the same varieties having ripened at a later period have escaped unscathed, or nearly so.

2d. Nothing of particular interest can be given of the history of this insect during its existence in these parts, except that it has been more destructive some seasons than others. The present season doubtless less destructive than ever before. My observation will not warrant me in stating at what particular year it has proved most destructive. And, doubtless, causes which are beginning to be understood, have aided much in avoiding the destruction heretofore met with.

3d. There has been no total abatement of the ravages of this insect since it first made its appearance in this section. Yet there have been many instances where particular fields have entirely escaped injury with certain varieties of wheat, particularly the *Mediterranean*, the past and present season, where not a single maggot could be found.

4th. No instance is remembered twenty-five years ago of wheat being injured by this insect as it now is, with heads rough and ragged and the kernels shriveled.

5th. The barley crop of 1857 and 1858 is said to have been slightly infested with the *wheat midge*, yet some doubts exist as to the fact.

6th. The *Mediterranean* variety of winter wheat in this locality has thus far escaped injury from any insect, and affords good yields, particularly the present season.

7th. Crops situated upon dry hilly uplands are generally much less injured than lowland intervals.

8th. The amount of damage done the present year has not exceeded one-eighth that of some former years. The probable yearly damage since the *midge* first made its appearance (with the exception of the two past seasons) may be safely set down as one-half the entire crop sown. The data from which to base conclusions, is only from the practical experience of the writer and general observation. There can scarcely be an approximation to the just amount of damage resulting from the depredations of these insects annually. The United States census of 1850 gives the annual product of the wheat crop in Oneida county as being 76,805 bushels, and in the entire counties of the State as something over thirteen millions of bushels, from which it can be seen that the annual damage to the wheat

growers of this State alone is a sum of no small magnitude, and loudly calls for investigation, to search out a remedy.

9th. Very many people have resorted to experiments to prevent the lodgment of this insect in their wheat fields, by sowing *slaked lime* around the borders of the field when the dew is on, at the time and after the heads of wheat begin to make their appearance; also gypsum, in the same manner, which is supposed by those experimenters to act as a preventive, and at the same time beneficial to the crop. *The most effectual remedy is the early sowing of winter wheat*, say the last week in August and first week in September, when the crop generally ripens or grows in advance of this troublesome pest. On the other hand spring wheat generally escapes best by late sowing, although it is more exposed to other casualties such as *blight* and *rust*. The ravages of the *wheat midge* is, as a general rule, effected upon those crops which ripen or mature the *last half of the month of July and the first week in August*. If the crop can be sown so as to ripen previous to that time, but little if any damage need be apprehended.

10th. No parasite insect has been seen which destroys the *midge*.

11th. No damage to wheat by the "Hessian fly" has been noticed in this section for the last thirty years, nor that of any other insect except the *midge*, and aside from the *grasshoppers*, which have in some localities taken all before them the present season in the vegetable line, from a crop of spring wheat down to that of the *bull-rush*. They, however, are not partial to any particular plant—their keen demands of appetite lay waste all living green.

L. T. MARSHALL.

VERNON CENTER, ONEIDA COUNTY, N. Y. *Sept. 5th*, 1859.

ONONDAGA COUNTY—HENRY ELLERY.

1. In answer to the enquiries sent from the New York State Agricultural Rooms, in Albany, to the Secretary of the Farmers' Club of Skaneateles, and handed to me, I would reply: The first of the *midge* that I discovered in my wheat fields, was in 1846, but did very little damage, as they were but few, and was principally in the edge of the wheat only, adjoining the fences; they kept annually increasing; the injury sometimes amounting to a quarter or a third of the crop, or more.

I generally sowed both, the Mediterranean and the Soule's variety, in the same field, for experiment. For a few years, the Mediterranean was not attacked by the *midge*; afterwards it appeared to be about equally damaged. I then preferred sowing the Soule's, as it yielded as well as the Mediterranean, and commanded a better price in market.

In the fall of 1852, I prepared a field of fourteen acres, and manured it with barn-yard manure; it was sown with the Soule's wheat. The seed was put in with a Suffolk manure drill, and about seventy-five bushels of compost drilled in to the acre with it, composed of ashes, made from old logs, stumps, sods, &c., taken from a ditch, made through a swampy piece of land, mixed with ground bones, lime and salt. It was sowed the first

week in September; it grew very rapidly, and completely covered the ground, with a broad, heavy blade. It stood the winter well, and was very forward in the spring; the ashes and bones being directly at the root, stimulated it rapidly ahead with a heavy growth, apparently enough to yield thirty-five or forty bushels per acre. I have sometimes had more where the prospect was not so good. In June, the midge attacked it severely, and nearly destroyed it, the crop only yielding seven bushels per acre.

I then gave up sowing winter wheat for some time, and have since sown the fife spring wheat, with fair success. By sowing rather late, sometimes the middle of May, or later, it has mostly escaped the weevil or midge. Growing wheat has not been totally abandoned in this neighborhood; some years, however, but little has been sown. In the fall of 1857, I tried some winter wheat again. I procured some early white wheat, from South Carolina, it has answered well; by maturing earlier, it escaped the midge more than any other variety here, and yielded well.

I think it would be profitable to renew the seed again every two years, from the Carolinas, Tennessee, or Georgia, as when sown here it gradually becomes later in maturing.

2. From my observation it was the most destructive in 1853; least in 1858 and 1859.

3. The midge has never, wholly, disappeared here.

4. Have not known any here previous to 1846; it had been destructive for some time before, in the eastern part of the county; it is progressing westward.

5. Barley, sometimes, has been injured by it, to some extent; it is now given up as a crop here, from other causes.

6. None of the varieties of wheat, I have been acquainted with, has entirely escaped. The Southern white was the least affected, in consequence of ripening earlier than the other kinds.

7. The dry rolling lands are considered the best, the crops the least injured, probably owing to the breezes of wind disturbing the fly while in operation.

8. The damage, some seasons, has been from a quarter, to one-half, or more, in some instances; the present season but trifling.

9. Quick lime has been tried, by sowing, while the dew was on, or after a shower of rain, but do not know that it has been of much benefit; it is rather a tedious operation.

10. Have not discovered any parasite to destroy the midge.

11. Have not seen any damage here by the Hessian fly, for the past ten or twelve years.

Winter wheat has done better the last two years; is increasing gradually, in consequence of the partial disappearance of the midge; more is being sown this fall, than has been for some years past. Undoubtedly the cold weather, and frosts in June, and the early part of July, had a tendency to check the ravages of the midge this season.

It, perhaps, would not be wise to place too much dependence, at present, on too large a breadth of wheat, until further and more satisfactory evidence is given that the midge has passed away, or we may, again, be disappointed, and incur a heavy loss; the midge may only be checked, and not entirely left.

SKANEATELES, *September, 1859.*

ORLEANS COUNTY—T. C. BAILEY.

ALBION, *September 7th, 1859.*

B. P. JOHNSON :

Dear Sir—Your circular with inquiries about the midge, I will try to answer according to the best information I can get.

Question 1. In 1853 it came from north-east; not very destructive the first year or two. After one or two years the growing of wheat was mostly abandoned. I am not prepared to give a history of it in any better way than by answering the following questions: It was most destructive in 1855, 1856 and 1857; least injurious in 1858 and 1859.

Ques. 3. It has never wholly disappeared.

Ques. 4. Before the midge, we had a worm that eat the grain after it became hard. It was a short measuring worm about one-quarter of an inch in length. It was not very destructive. That occurred, I think, about fifteen or more years since.

Ques. 5. The midge injured spring barley.

Ques. 6. No varieties escaped. The Mediterranean has been the least injured.

Ques. 7. Grain upon high, sandy soils, are much less injured than on low land. In some sections, they have grown wheat right along, with pretty good success.

Ques. 8. The amount of damage the past season is but small; almost invariably a good crop. It is very difficult to estimate the amount of damage. The farmer has been obliged to change his routine of crops; and perhaps in the end, it will lead to a better system of farming.

Ques. 9. I know of no remedy.

Ques. 10. Have not seen any parasite insect.

Ques. 11. No damage from the Hessian fly for the last few years.

It is the prevailing opinion among our most intelligent farmers, that in order to raise wheat successfully, we must get the early varieties; sow on rich, quick soil, that the wheat may ripen before the time of the midge. We believe it does its work in a few days. By observation, we find that wheat, in the same vicinity, if sown rather late, on rather cold soil, will be destroyed, while otherwise it escapes. I have no specimens of the midge, or other insect, to send.

TOMPKINS COUNTY—EZRA CORNELL.

To Col. B. P. JOHNSON, *Secretary*.

New York State Agricultural Society :

Dear Sir—In answer to the inquiries contained in your circular of August, 1859, respecting the ravages of the "wheat midge," "Hessian fly," and other enemies on wheat, I beg leave respectfully to report :

1st. The wheat midge appeared in the north-east portion of Tompkins county, so as to first attract attention about the year of 1846, and reached the center of the county by 1850; and a year later, I hear of it in the south-west town of the county. It appears to have come into our county from Cayuga county, on the east side of Cayuga lake, and progressed south and south-west through the county, where it first appeared; its attacks were confined to the borders of fields, and those portions that were latest in maturing. The ravages increased from year to year, to such an extent, that the culture of wheat was abandoned by many farmers entirely, and very few attempted to raise more than enough to supply their family wants, and to this time the crop has not been restored. The midge, however, has been less destructive to the crop the past year or two, doing very little damage the past year, and the breadth of wheat is increasing gradually. I estimate that double the quantity of 1858, was sown last fall.

2d. I know but little of its history, save what is given in above answer.

3d. I think it has not wholly disappeared at any time.

4th. No recollection of anything till the midge appeared. Wheat had been a standard crop of our county for thirty years or more, and could be relied on with so much certainty, that a farmer without means did not hesitate to buy a farm on credit of a few years, and base his payments on his annual sales of wheat; the fluctuations in the price of wheat was the only question he considered; that he could raise the wheat he was positive of.

5th. Barley appears to have been infested by this insect in some localities, but not as a general thing. No other grains that I am aware of.

6th. Perhaps no variety has escaped wholly. The Mediterranean has received less injury than other varieties.

7th. The lands on which the crop matures the earliest, is least affected.

8th. Very little damage the past season; scarce worthy of notice.

9th. Very little has been done in the way of remedies; the withholding of gypsum, so as to allow early ripening, the only remedy I know of that has been practiced. The use of gypsum increases the growth, and makes the crop a few days later, hence is deemed injurious.

10th and 11th. Don't know of any parasite and no damage from Hessian fly.

YATES COUNTY—JOB L. BABCOCK, *Pres. Ag. Society*.

B. P. JOHNSON, *Secretary, &c.*

Dear Sir—In answer to your circular concerning the wheat midge, we will answer for Yates county as follows :

1. The wheat midge was first noticed here about nine years ago; it came from the north east. For the first two or three years it was not very inju-

rious, but after that it rendered the attempt to raise wheat a serious loss. The growing of wheat was not wholly abandoned, but was very nearly. We only tried to raise enough for bread, and not always that.

2. In late, wet seasons, it has been most destructive; three years ago it was the worst.

3. It has not wholly disappeared at any time.

4. Wheat never was injured by the midge here before.

5. Barley and clover seed have been affected to a small extent.

6. No varieties of wheat have escaped injury, but the Mediterranean and the Golden drop have suffered least.

7. Grain on high rolling land least injured.

8. The damage in this county, the past year, has been very little. The decrease for the past five or six years, up to this year, has been from three to four hundred thousand bushels in this county yearly. The damage would have been as much, if as much had been sowed as usual.

9. No remedy has been tried except early sowing, and sowing early varieties, and that has not proved entirely effectual.

10. No parasite has been noticed here.

11. Years ago, wheat was damaged occasionally by the Hessian fly, but not within the past ten years, I think.

Yours, &c.,

JOB L. BABCOCK,
Pres. Yates county Ag. Society.

STATISTICS—CROPS, 1859.

We have received returns from *twenty* counties, and give the average crop.

Winter wheat, 20 counties, average crop, 19 10-100 bushels; 1858, 13 13-100 bushels.

Spring wheat, 18 counties, average crop, 16 5-100 bushels; 1858, 13 2-100 bushels.

Corn, 17 counties, av. crop, 25 5-100 bush.; 1858, 40 8-100 bushels.

Rye, 15 do 14 12-100 do 16 8-100 do

Barley, 16 do 25 6-100 do 20 8-100 do

Oats, 18 do 40 10-100 do 24 8-100 do

Buckwheat, 8 do 22 10-100 do 15½ do

Flax, no report; *Potatoes*, partial report, from 100 to 150 bushels.

Peas, average about 22 bushels; 1858, 20 bushels.

Beans, average about 20 bushels; 1858, 19½ bushels.

Hay, very light; injured by frost; not over one ton; 1858, one and a half tons.

Fruit, in some sections excellent; in others, cut off by frost.

Winter wheat less injured by wheat midge, than for many years; crop excellent, quality very fine. In three counties, crop an average; four, under average; thirteen, above an average; and the crop over 1858, about six bushels per acre.

Spring wheat.—Thirteen counties report over an average crop, and five under an average; three bushels average more than 1858.

Corn.—Twenty-five bushels an acre under the average, in consequence of the *severe frost and cold weather*; less than 1858, fifteen bushels per acre.

Rye.—Under an average, seven counties, and eight counties above an average; less than 1858, about two bushels per acre.

Barley.—Five counties under average, eleven counties usual yield, or above the average; five bushels more than in 1858.

Oats.—Eighteen counties report above an average crop; the crop was remarkably heavy and fine; sixteen bushels per acre more than in 1858.

Buckwheat.—Only eight counties reported the buckwheat crop, and the yield averages twenty-two bushels per acre; seven bushels more than 1858, with returns then, from sixteen counties.

Potatoes.—The crop has been, in general, a good one, freer from the disease than for several years, and the yield has been larger.

Peas and beans not very extensively cultivated, and give about the average yield, from twenty to twenty-two bushels per acre.

Hay.—This crop has been very seriously injured by the frosts, and in several counties reported as not exceeding half a crop. Its loss has been severely felt in the dairy districts of the State.

Fruit.—The returns show, in some counties, a very fine crop of apples; in others, the fruit was injured by the frost, and most of the fruit destroyed.

Drained lands.—In every county in which draining has been introduced, the crops are improved and less affected by disease. It is very gratifying to notice the attention which is being given to drainage.

Farming improving.—It is stated, in the reports from counties, that there is a decided improvement in farming. We give the answers which have been received :

"The agricultural interests of the county are steadily improving." "There is a steady improvement in the husbandry of this county." "The condition of farming in our county is constantly improving." "There is a decided improvement in the farming in our county." "More enterprise, and a steady improvement in the condition of farming."

"The general condition of farming is very favorable." "The farmers of the county are gradually but surely progressing in knowledge and practice." "General condition of farming improving considerably; stone walls being built, more attention to fruit culture, improved implements, mowers, and gang plows in use, and drains made, and buildings and fences improved."

"Farming is still greatly improving, and in this county we expect a high standard." "The general condition of farming is much better; and if not first, yet, it is steadily improving." "The general condition of our farming improving, and our fairs give decided evidence in the fine display of improved stock." "The people of this county are beginning to farm much better than formerly, and, of course, are making more money." "A perceptible improvement has taken place the present year in every department of husbandry."

"I think each year adds somewhat to the improved condition of our farms; manuring is becoming more general, and draining progresses slowly." "We claim for our county that it is progressing in the right direction." "There has been a great improvement in farming in our county. Deep plowing, draining, and the introduction of labor-saving machines, with the very general diffusion of agricultural journals, have done much to improve farming; stock also much improved."

This is the testimony of intelligent and observing farmers in sixteen counties, ranging from Queens county to Chautauqua, thus embracing every section of the State.

The reports in detail, are given, and while it is to be regretted that we have not many more counties, it will be seen by reference to the county

reports, that an equally favorable state of things exists in several counties from which we have no statistical returns. Those, in addition to the number which have reported, comprise considerably more than half the counties in the State.

It was hoped that the Legislature would, at its present session, have matured a bill for an annual return of the products and animals of the State. Of its good advantage we have no doubt; and we trust that ere long it will be accomplished. J.

REPORT AND ANSWERS TO CIRCULAR.

STATE AGRICULTURAL ROOMS, }
ALBANY, August 1859. }

SIR—I am desirous of ascertaining, as far as practicable, the state of agriculture in your county, the present year, and desire you to answer the annexed questions, and be particular in regard to the deficiencies (if any) of the usual crops, and the causes of the same, as far as may be known. Please return the answers on the annexed schedule, as soon as they can be satisfactorily ascertained.

Respectfully yours, B. P. JOHNSON, Sec'y.

BROOME COUNTY.

W. L. PECK, *Lisle.*

1. Winter wheat—fifteen bushels per acre; quality good; six bushels more per acre than usual; affected slightly by midge or weevil; not raised to any great extent.

2. Spring wheat—fifteen bushels; six to eight bushels more than usual; affected by midge slightly.

3. Indian corn—frosts in June and September about destroyed the crop; very little sound corn raised, except in favored portions.

4. Rye—twelve bushels per acre; quality good; less than usual; frosts in June, injured the crop.

5. Barley—but very little raised in Broome county.

6. Oats—forty bushels per acre; quality good; ten bushels per acre more than usual; heavier crop than ever before raised.

7. Buckwheat—about ten bushels per acre, good; about the usual yield; frosts in September injured the crop.

8. Potatoes—light crop; somewhat affected by the rot.

9. Peas—but little raised as a field crop.

10. Beans—but little raised as a field crop.

11. Hay—One ton or less per acre; an unusual light yield.

13. Q. To what extent, if any, has wheat been affected by the midge? Have any varieties escaped the ravages of the insect? A. Winter wheat but little affected.

14. Q. Have drained lands been less injuriously affected than undrained lands, by wet or drouth? A. Not a sufficient amount of drained lands to determine.

15. Q. What is the general condition of farming in your county, as

compared with former years? A. The agricultural interests of the county are steadily improving. Our Society has been in existence two years, and has been very successful.

CHAUTAUQUA COUNTY.

A. S. Moss, *Fredonia*.

1. Winter wheat—fifteen bushels per acre; quality, No. 1; average yield; affected some by midge and fly; early maturity is the best remedy for midge.

2. Spring wheat—fifteen bushels; quality, No. 1; larger amount sown, and better than average; some midge; frost hurt wheat some in two or three towns.

3. Indian corn—twenty-five bushels; better than usual if it ripens; it is quite late.

4. Rye—but little sown; it is good.

5. Barley—twenty-five bushels, average yield. The barley crop is not largely grown in this county.

6. Oats—thirty-five bushels; better than usual; healthy this year; a large amount sown.

7. Buckwheat—but little sown."

8. Potatoes—one hundred bushels: early potatoes were poor, but the later look well and healthy; large amount planted.

9. Peas—fifteen bushels, average yield.

10. Beans—fifteen bushels; look well.

11. Hay—one-half ton per acre; less, by one-half, than usual. The frost and spring drouth affected this crop severely.

12. Fruit—varieties grown—apples, pears and plums; average in lake towns. But three-quarters of the county has little or none.

13. We raise but little winter wheat, and that is mostly white kinds. The midge has done some damage for three or four years.

14. We have but little drained land (artificially); but the drained lands, by nature, are most productive.

15. There is a steady improvement, in husbandry, in this county; but we are too far behind our eastern brethren.

CHENANGO COUNTY.

J. WELLS, *Norwich*.

1. Winter wheat, ten bushels; rather better than usual; less injured by the midge; affected by midge. Early sowing and early varieties are less liable to be affected; very little sown in the county; was not so much affected this last year as usual, owing to its being earlier and got the start of the midge.

2. Spring wheat—about thirteen bushels; better this year than usual; affected by the midge on all the lowlands. Don't know of any remedy. The uplands were excellent, not affected at all, while near all that was on lowlands was entirely destroyed.

3. Indian corn—nothing worth mentioning; about worthless; almost an entire failure. Frosts cut it off in June, and again in the fall. Don't think there was two thousand bushels raised in the county.

4. Rye—thirteen bushels; average yield; slightly injured by the frost in some places, but not bad. But little raised compared with some other crops, say about 15,000 or 16,000 bushels.

5. Barley—twenty bushels; good quality; average yield; no disease. There is raised from 20 to 25,000 bushels in the county, principally in the north part.

6. Oats—thirty bushels; best quality; nearly or quite double usual yield; no disease. The oat crop has not been as good in twenty years.

7. Buckwheat—fifteen bushels; good quality; more than a usual yield; injured by frosts in September considerably. Large amount sown where frost cut off the corn, and more than usual raised.

8. Potatoes—one hundred and twenty-five to one hundred and fifty bushels per acre, and generally of good quality; rather better than an average yield for the last ten years; affected by blight or rot, but not as bad as some seasons; I know of no remedy. The crop was generally a fair one, better than usual since they have been affected with the blight. It is singular that there has been no remedy discovered; the best that I have found is to change the seed as often as possible.

9. Peas—very few raised; about the same as other years.

10. Beans—nearly ruined by frosts; very few raised.

11. Hay—Eighteen hundred pounds to the acre; about seven-eighths of a crop, owing to the open winter the grass was killed in a great many meadows. The hay crop is by far the most important crop in the county, as you will see by the statistics.

12. Fruit—about half our usual crop; an average for the last few years. The apple is generally destroyed or much injured by a worm, when about the size of a hickory nut, and falls off. This last season the apple, in the early part of the season, bid fair to be abundant, but about half fell off when about the size of an egg. I know of no remedy.

13. I think one-fourth of the wheat crop has been more or less injured by the midge, generally on the lowlands. The Mediterranean variety has been the least affected. I have noticed that the earliest pieces of wheat are the least affected.

14. Our county being hilly and uneven, farmers have not gone into draining to much extent, not so much as would be profitable for them. There is no question about the utility of drainage.

15. The condition of farming in our county is constantly improving. The prices of land have increased from year to year. We, in all respects, are a dairy county. The products have commanded a high price through all the pressure of the money market for the last few years, which has been so disastrous to the grain growing portions of our country; our county has all the while been making money, and farmers growing rich.

DELAWARE COUNTY.

R. B. GIBBS, *Harpersfield*.

1. Winter wheat—twenty bushels ; ten per cent. better than usual.
2. Spring wheat—fifteen bushels ; usual yield, affected in some places by midge.
3. Corn—fifteen bushels ; fifty per cent. short ; affected by June frosts ; mostly plowed up and sown to barley or buckwheat.
4. Rye—twelve bushels ; twenty-five per cent. short ; affected by June frosts.
5. Barley—twenty-five bushels ; usual crop ; more sown than common.
6. Oats—thirty-five bushels ; twenty per cent. better than usual.
7. Buckwheat—twenty-two bushels ; medium yield, late sown, was injured by September frosts. Much more ground sown than usual in place of frosted corn.
8. Potatoes—one hundred and ten bushels ; ten per cent. better than usual.
9. Peas—fifteen bushels ; usual yield ; not largely sown.
10. Beans—So few planted they cannot be well estimated.
11. Hay—twelve hundred per acre ; thirty-three per cent. short ; affected by dry May and June frosts.
12. Fruit—scarce ; there is probably enough for home use, but little for market.
13. Spring wheat has suffered more than winter ; in some locations it was almost a failure, in others a full crop, twenty bushels or over. No varieties, to my knowledge, have escaped the ravages of the insect.
14. The comparison as to draining has not come to my notice.
15. There is a decided improvement in the farming in our county.

FULTON COUNTY.

ELISHA BRIGGS, *President Ag. Society*; JOSIAH YANNEY, *Secretary*;
CHARLES PRINDLE, *Treasurer*.

1. Winter wheat sixteen to eighteen bushels ; quality fair, full yield, slightly affected by the midge ; not much sown.
2. Spring wheat—about eighteen bushels ; fair average yield ; affected by weevil or midge ; some fine crops were sown late.
3. Corn—about twenty bushels ; half crop ; no particular disease ; much injured by frosts in June and September.
4. Rye—From fifteen to sixteen bushels ; good quality ; usual yield ; no disease.
5. Barley—From thirty to thirty-five ; very fine ; above usual yield ; no disease ; a very fine crop.
6. Oats—Forty bushels ; fine quality ; rather more than ordinary ; no disease ; will weigh from thirty to thirty-five pounds.
7. Buckwheat—about twenty bushels ; very good quality ; late ; injured by frost ; early sown good.

8. Potatoes—about 150 bushels per acre; quality very good; usual yield; somewhat affected by the rot; some very fine crops.

9. Peas—about fifteen bushels; usual yield; no disease; we sow about the first of June to avoid the bug.

10. Beans—Rather a failure on account of the frosts in June.

11. Hay—about one and a half tons per acre; good quality; fair yield; affected by drouth in some locations.

12. Fruit—Not an average yield; some orchards much affected by the borer; more common, than grafted fruit affected this season.

14. Drained lands less affected than undrained.

15. More enterprise, and a steady improvement in the condition of farming.

GENESEE COUNTY.

N. K. CONE, *Corresponding Secretary Agricultural Society, Batavia.*

1. Winter wheat—ten bushels; affected by frost. There would have been a good yield had it escaped the frost, say twenty bushels to the acre.

2. Spring wheat—twenty to twenty-five bushels; much better than usual; escaped all diseases.

3. Corn—twenty-five bushels; much injured by frosts, early and late.

4. Rye—ten bushels; affected by frost.

5. Barley—Winter barley more or less injured by frost, probable yield thirty bushels; very little spring sown.

6. Oats—thirty bushels; affected by grass hoppers.

7. Buckwheat—twenty bushels; less than usual yield. Frost late in September injured the crops.

8. Potatoes—One hundred and fifty bushels; better than usual; some dry rot.

9. Peas—very few sown.

10. Beans—twenty-five bushels; part injured by frosts.

11. Hay—three-fourths ton per acre; badly injured by frosts; some fine meadows not mown at all.

12. Fruit—Good where not injured by frosts; many localities all destroyed.

13. The midge has done but little damage this season.

14. Am not able to report as to drained lands.

15. There is a gradual change from wheat growing to other sources of income by many of the farmers, still there will be more wheat sown this fall than formerly has been, on account of no injury from the midge.

JEFFERSON COUNTY.

DANIEL PARKER, *Chairman Viewing Committee Agricultural Society.*

1. Winter wheat—about fifteen bushels; good quality; yield rather better than usual; affected by rust and insect; remedy early sowing. We can do better in dairying and barley.

2. Spring wheat—from six to twenty-five bushels; fair quality; no

material difference in yield; adopt early sowing to prevent rust, and then more liable to insect. Late sowing to prevent insect, and then more liable to rust. With good cultivation and sown about 15th May, we generally do well.

3. Corn—not to exceed ten bushels; good quality; far below usual yield; affected by frosts in June and September.

4. Rye—about sixteen bushels; average yield; seldom sow any except to seed down timothy seed in the fall.

5. Barley—Thirty bushels; rather below usual yield; joint worm in the straw, we are generally pleased with the barley crop.

6. Oats—thirty to fifty bushels; average crop. Rust affects late sowing; not cultivated to any great extent.

7. Buckwheat no return.

8. Potatoes—one to two hundred bushels; above usual yield; no disease.

9. Peas—twenty bushels; usual yield; remedy for bug, not sow too early. The pea bug has troubled us but little the past few years.

10. Beans—an average crop; but little sown.

11. Hay—from one-half to two tons; somewhat below usual yield; affected by open winter; remedy, high manuring.

12. Fruit—about an average.

13. About one-fourth of spring was destroyed; no one variety appears to be less affected than another.

14. Drained lands are less affected than undrained.

15. The general condition of farming in our county is very favorable.

MADISON COUNTY.

L. B. KERN, *Secretary Agricultural Society, Morrisville.*

1. Winter wheat—twenty-eight bushels; better than usual; not troubled by the fly.

2. Spring wheat—twenty-five bushels; better yield than usual; affected by midge; fly has troubled wheat sown late.

3. Corn—twenty to twenty-five bushels, yield not as good as usual; corn in our county generally killed by frost in June.

4. Rye—none raised to any extent.

5. Barley—thirty bushels—better than last year.

6. Oats—never better.

7. Buckwheat—good; more raised.

8. Potatoes—good.

9. Peas—good.

10. Beans—killed by frost; light.

11. Hay—one and a half tons per acre; less than usual; affected by drouth.

12. Fruit—very little fruit of any kind in our county, in consequence of frosts.

13. Winter wheat has escaped the insect.

15. The general condition of farming about the same as in former years.

MONTGOMERY COUNTY.

A. H. BURTCB, *Secretary Agricultural Society, Fonda.*

1. Winter wheat—fifteen bushels; usual yield; affected some by rust.
2. Spring wheat—ten bushels; full yield.
3. Corn—twenty-five bushels; usual crop.
4. Rye—twelve bushels; usual crop.
5. Barley—twenty bushels; usual yield.
6. Oats—thirty-five bushels; extra crop.
7. Buckwheat—unable to tell; will, probably, be good, if not affected by frost.
8. Potatoes—forty-five bushels.
9. Peas—twenty-five bushels.
10. Beans—killed by frost.
11. Hay—one and a half tons per acre.
12. Fruit—light; rather better; affected by frost.
13. No variety entirely escapes the insect.
14. Drained and undrained lands are about equally affected by drouth and wet.
15. The general condition of farming is about the same, with the exception of fruit.

ONEIDA COUNTY.

S. A. BUNCE, *Vernon Center.*

- 1 Winter wheat—twenty-five bushels; first rate quality; much better than usual; not affected this year.
2. Spring wheat—twelve bushels; poor quality; affected by midge; no remedy known.
3. Corn—twenty-five bushels; poor quality; about two-thirds of a crop; early frost and cold weather affected it.
4. Rye—but very little grown.
5. Barley—twenty bushels; good quality; double the usual yield; insect in the lower joint of straw; do not know of any remedy.
6. Oats—forty or fifty bushels; first rate quality; twice the usual yield; crop not affected.
7. Buckwheat—fifteen bushels; fair quality; some better than usual; no disease.
8. Potatoes—one hundred and fifty bushels; good; usual yield; have seen no indications of rot.
9. Peas—very few grown; good quality.
10. Beans—fifteen bushels; very good; about the usual yield.
11. Hay—two thousand pounds per acre; poor; not over two-thirds of a crop.
12. Fruit—poor; scarcely any in our vicinity.
13. Winter wheat has escaped the midge.
14. Drained lands are least affected.

15. I think the condition of farming is as good as for many years ; and that the farmers of Oneida are gradually, but surely, progressing in knowledge and practice.

ORLEANS COUNTY.

ARAD THOMAS, *Treasurer Agricultural Society, Albion.*

1. Winter wheat—twenty bushels ; much larger yield than usual.
2. Spring wheat—sixteen bushels ; large yield.
3. Corn—about half a crop ; affected by frost.
4. Rye—not much sown.
5. Barley—less than usual ; less sown this year.
6. Oats—injured by early drouth.
7. Buckwheat—light yield ; affected by frost.
8. Potatoes—better than usual.
9. Peas—small yield.
10. Beans—very few raised ; injured by frost.
11. Hay—light ; affected by drouth ; second mowing almost as good as the first.
12. Fruit—abundant yield ; extra large crop of apples and pears ; peaches a failure ; plums and grapes fair.
13. Less midge than usual ; many think wheat sown early escapes the midge ; thinks the red Mediterranean the best winter, and Canada club best spring variety.
14. Drained land less affected than undrained.
15. General condition of farms improving considerably ; stone walls being built ; more attention to fruit growing ; work done with improved implements—mowers, gang plows, &c., &c. Drains made ; buildings and fences improved. Contra Canada thistles, wild mustard and red root increasing on some farms.

QUEENS COUNTY.

JOHN HAROLD, *Secretary Ag. Society, Hempstead.*

1. Winter wheat—a better crop than for several years past. The quality is very good ; ear well filled ; seed plump and heavy, averaging in weight sixty-one to sixty-two pounds, the scaled bushel. One lot weighed sixty-four pounds, yielding twenty-three bushels per acre ; very little injured by either of the usual depredators on wheat.
2. Spring wheat—twenty-two bushels per acre, while we can raise winter wheat, little attention will be paid to spring wheat.
3. Corn—Unfavorable weather caused late planting ; a great breadth had to be replanted ; the quality is not so good as usual ; yield not over thirty bushels per acre, and much of what was exhibited at our winter meeting was still soft.
4. Rye—Fifteen bushels per acre.
6. Oats—a fair crop ; average thirty-five bushels, weighing thirty-one

to thirty-six pounds. The highest yield fifty bushels per acre. Oat straw heavy and bright.

7. Buckwheat—about twenty bushels; quality good; weighing forty-six to forty-nine pounds per bushel.

8. Potatoes—Not less than one hundred and forty bushels per acre. Mercers are considered the most profitable crop; average price \$2.25 per barrel. Peach blows are getting out of favor from their liability to rot, and increased time in growing.

9. Peas—this crop is carried to New York in the pod, and efforts are made to have them there as early as possible. The yield for the past year is about one hundred bushels per acre; and from conversations with many raisers of market truck, the average price for early and late peas, is seventy-five cents per bushel.

10. Beans—beans are carried to the same market as peas; dwarf refuge beans yield one hundred bushels per acre; average price, 50 cents per bu. Lima beans yield about one hundred and ten bushels; price ninety cents per bushel.

11. Hay—Very light this year; the average probably not over one ton per acre; average price by the load of loose hay, \$1.00 per hundred.

Straw—Rye straw sells at the paper mills for about ten dollars per ton. Oat straw, nine dollars per ton. Rye straw bound in sheaves when thrashed by flail, and made up neatly, will bring, in New York city, nearly twenty dollars per ton.

12. Fruit—a better crop than last year. Apple trees do not seem to have suffered so much from the borer as previously. The sour cherry and plum are troubled with the black wart, for which no remedy has as yet been found.

15. Farming is still greatly improving, and in this county we expect a high standard.

ROCKLAND COUNTY.

M. G. LEONARD, *Rockland Lake.*

1. Winter wheat—about twenty bushels; better than usual. Have heard of no disease affecting crop; not much raised.

2. Spring wheat—the small quantity raised reported good.

3. Corn—Forty-five to fifty bushels; yield not as good as usual; affected by excess of wet and cold. Is a good crop in our county.

4. Rye—twenty to twenty-five bushels; better than usual; season favorable. Is a good crop in our county.

5. Barley—not grown with us.

6. Oats—thirty to forty bushels; much better than usual; season favorable; a valuable crop.

7. Buckwheat—twenty to twenty-five bushels; good yield; not yet matured, may be affected by frost.

8. Potatoes—One hundred to one hundred and fifty bushels; better yield than usual; slight indications of rot.

9. Peas—not raised as a field crop.

10. Beans—produced most as garden vegetables.
11. Hay—one and a half tons per acre ; average crop.
12. Fruit—Much less than usual ; pears excepted ; mostly a failure this year.
13. I have heard of no wheat being affected by the midge this season.
14. Have no satisfactory statistics, or reliable ones to report as to the effect produced on drained or undrained land by drouth or wet.
15. The general condition of farming is much better than formerly, and if not first, yet it is steadily improving.

ST. LAWRENCE COUNTY.

L. E. B. WINSLOW, *Secretary Agricultural Society.*

OFFICE ST. LAWRENCE CO. AG. SOCIETY, }
CANTON, N. Y., Jan. 9th, 1860. }

B. P. JOHNSON, ESQ.:

Dear Sir—In the preparation of the following report, the opinions of so many farmers in different parts of the county have been consulted, that I have confidence in its approximation to correctness.

A favorable spring resulted in the planting and sowing of an unusual amount of grain, and, for a while, crops never promised better. Soon, however, they were checked by a want of rain ; then an early frost seriously damaged the grass, and injured some other crops ; and then a late frost ruined our corn, and completed what the early frost had left undone.

1. Winter wheat—The little sown in this county has averaged twenty-five bushels per acre, which is, perhaps, an unusual yield. Our farmers place the usual yield from twenty to twenty-five bushels.

2. Spring wheat—Twenty bushels, which is full an average yield.

3. Rye—Twenty bushels ; but little raised in this county.

4. Indian corn—Stood well, and gave promise of a large yield, but a heavy frost in September nearly ruined the whole crop. Yield of sound corn ordinarily not less than forty bushels per acre ; this year probably about ten.

5. Barley—Twenty-five bushels, which I consider full an average yield ; but little raised.

6. Oats—A large crop, and heavy grain ; average not less than fifty bushels per acre. More oats were sown last year than ever before in this county, and yet the price is high on account of the scarcity of hay ; held now at fifty cents per bushel.

7. Buckwheat—Twenty bushels per acre, which is an average yield ; but very little is sown.

8. Potatoes—175 bushels, which is probably a usual yield ; very little complaint of rot.

9. Peas—Twenty bushels ; quality good ; very few eaten by worms.

10. Beans—Twenty bushels per acre ; less than usual yield. The experiment has been tried, in this county, of planting beans very thick on rich soil, and succeeded well.

11. Hay—One ton per acre ; the usual yield is not less than one and a half tons, generally estimated higher. Grass was somewhat affected by drouth, but the main cause of the shortness of the crop was frost.

12. Fruit—Light in quantity, but good in quality. Fruit, in this section, is doing better late years than formerly.

Wheat midge have nearly left this county, but not for want of wheat to work upon, for more and more is sown every year.

The people of this county are beginning to farm better than formerly, and of course are making more money. An unusual effort is making, to improve the breeds of animals, and to provide them with warm and comfortable stables ; many farmers now stable their entire stock days as well as nights. More attention is paid to saving and making manure, ditching, fencing, &c.

SCHOHARIE COUNTY.

J. GEBHARD, *Schoharie*.

1. Winter wheat—twenty bushels ; three times usual yield ; no disease ; a perfect success in all parts of the county.

2. Spring wheat—fifteen bushels ; good quality ; treble usual yield ; good crop.

3. Corn—thirty bushels ; about two-thirds of a crop ; spring and autumn frosts affected crop ; corn on upland, very slim.

4. Rye—twenty-five bushels ; usual yield ; not diseased.

5. Barley—thirty bushels ; good yield.

6. Oats—forty bushels ; first quality ; one third better than usual ; good in all locations.

7. Buckwheat—twenty bushels ; quality fair ; one-half crop ; affected by frosts.

8. Potatoes—one hundred and fifty bushels ; excellent quality ; double usual yield ; no disease.

9. Peas—fifteen bushels ; two-thirds of a crop ; affected by drouth.

10. Beans—twelve bushels ; two-thirds of a crop ; affected by drouth.

11. Hay—one ton per acre ; usual ; old meadows light.

12. Fruit—a light fruit crop ; injured by heavy spring rains and frosts.

13. No complaints are made, in our section, of the ravages of the insect ; all varieties appear to have escaped.

14. Drained lands are decidedly less affected by drouth and wet, than undrained lands. More lands have been drained this year than in any ten years before.

15. The general condition of farming is much better. A perceptible improvement has taken place the present year, in every department of husbandry.

SUFFOLK COUNTY.

JOSHUA B. SMITH, *Happauge*.

1. Winter wheat—twelve bushels ; light yield ; affected by Hessian fly.

2. Spring wheat—little or none raised.

3. Corn—forty bushels ; light crop ; season unfavorable.
4. Rye—ten bushels ; average yield ; no disease.
5. Barley—thirty bushels ; usual yield.
6. Oats—thirty to thirty-five bushels ; good yield.
7. Buckwheat—fifteen bushels ; usual yield.
8. Potatoes—seventy to eighty bushels ; average crop ; affected by rot ; no remedy known.
9. Peas—none raised, except in gardens.
10. Beans—from ten to twelve bushels ; usual yield.
11. Hay—two tons per acre.
15. General condition of farming, improving.

TIOGA COUNTY.

R. HOWELL, *Nichols*.

1. Winter wheat—from sixteen to twenty-five bushels ; plump and fine ; better quality, and larger yield, than for fifteen years before ; a few fields injured by the midge ; remedy, sow early.
2. Spring wheat—from fifteen to thirty bushels ; better than ever before ; a number of fields yielded thirty bushels per acre ; less injured by the insect ; principal variety, tea wheat ; sow about May 15th.
3. Corn—sound twelve bushels, and poor twelve bushels ; about one-third of a crop ; many fields injured by the wire and cut worm. This year's crop of corn was the poorest crop in ten or twelve years. On the Susquehanna flats a number of fields yielded from forty to sixty bushels per acre, while on hilly land hardly a bushel was sound ; corn generally eared well, but the principal trouble was frost in June and September.
4. Rye—fifteen bushels ; one-sixth less than usual ; a number of fields injured by the frost in June.
5. Barley—twenty bushels ; but little raised in county.
6. Oats—from thirty-five to seventy-five ; better than before in years ; some fields yielded about one hundred bushels.
7. Buckwheat—fifteen to twenty-five bushels ; about half a crop ; injured by the frost of September. The prospect of the buckwheat crop in September was never better, and the yield would have been forty bushels had the frost not affected it.
8. Potatoes—from seventy-five to two hundred bushels. The potato crop for this immediate vicinity was the largest of any year before in twenty years, and the best for eating ; yielding over two hundred bushels per acre, and some potatoes were found to weigh two pounds and over. I find it is a mammoth potato that weighs two pounds. From three pecks planting of a white variety, called by some *Prince Albert*, we had twenty-four and a half bushels, and they were very large ; from one and a half bushels of *California potatoes* we had fifty-four and three-fourths bushels of the finest potatoes I have seen in twenty-five years. In N. E. part Owego and Berkshire they rotted badly and yielded only seventy-five bushels per acre.

9. Peas—about fifteen bushels; but very few raised.
10. Beans—only raised in gardens; nearly destroyed by June and September frost.
11. Hay—three-fourths ton per acre; less than last year; injured by frost, open winter, worms and grass hoppers.
12. Fruit—not one-fourth of a crop; very fine trees did not bloom.
13. Wheat has been less affected than for twelve years before, no varieties wholly escaped.
14. No thorough drained land in Tioga county.
- 15 The general condition of farming constantly improving. Our county fairs prove it by the fine display of blooded animals, &c.

TOMPKINS COUNTY.

E. CORNELL, *Ithaca*.

1. Winter wheat—Twenty bushels; good quality; twenty per cent more than in 1858; affected by midge and oat stubble culture; no remedy for the midge, a more generous culture will cure the other.
2. Spring wheat—fifteen bushels; good quality; twenty-five per cent more than 1858.
3. Corn—fifteen bushels sound corn and fifteen bushels soft corn; quantity about the same as last year, quality poor, one-half soft, affected by frost in June and September.
4. Rye—ten bushels; crop falling off; not a favorite crop with our farmers, and less is being sown from year to year.
5. Barley—twenty-five bushels; quality good; quantity sown less; amount same as 1858. Oats taking place of barley.
6. Oats—thirty-five bushels; good; ten pounds per bushel better quality than 1858; double the crop of 1858.
7. Buckwheat—ten bushels; poor; about same as 1858, quality not as good.
8. Potatoes—eighty bushels; quality good; double last year's crop; some rot; more than last year.
9. Peas—not many grown.
10. Beans—not many grown.
11. Hay—three-quarters of a ton or less per acre; about one-half last year's crop.
12. Fruit—apples good crop. Pears good, increasing, more attention paid to their culture.
13. The midge has done very little damage, late sown and late varieties injured the most. Mediterranean not injured.
14. Drained lands are less injuriously affected by wet or drouth, than undrained.
15. Our farming is being improved slowly; I think each year adds, somewhat, to the improved condition of our farms; manuring is becoming more general; draining progresses slowly.

WAYNE COUNTY.

JOSEPH WATSON, *Clyde.*

1. Winter wheat—never better in this vicinity; from twenty-five to forty bushels; better than any yield since advent of midge; affected by midge, and winter or spring killing; remedy, early variety, and good and timely cultivation; great courage is taken, and a greater breadth of wheat sown this fall than usual, but it is feared too much upon summer crop stubble, and dry land, too hard to be well pulverized, and possibly may cause great disappointment in crop of 1860.

2. Spring wheat—some fields have done well; but this season, with others passed, proves that it is not as reliable a crop in this county as farther northeast.

3. Corn—from nothing to sixty bushels; not as good as usual; cold frosty spring, and cold frosty days of September, give a very large amount of soft corn. Early planted corn, on warm soils, is good; such a piece of mine is now, September 12, fit to cut; planted 18th May, and will yield sixty bushels. But another, on drained peat, was put back by frost, and must have ten to fifteen days yet to mature, which is about as others vary; and this last piece will be light at best.

4. Rye—Some very good pieces have been raised hereabout; but not much attention is paid to it, as most other crops pay better.

5. Barley—twenty-five bushels spring barley, and thirty-five winter barley; better than last year—but spring barley is yielding less annually; I don't grow this crop; the *beards* would get into my *Cotswold*, "*long hair*."

6. Oats—large and first quality; thirty-five to forty bushels; never better; and fifty per cent better than last year; nothing affects the crop but bad tillage; my crop was of Black Tartarian: grows very strong—stands up well; yields largely, and weighs heavily; no doubt over sixty bushels per acre; not thrashed yet.

7. Buckwheat—frost has affected it materially; and dry weather, about time of sowing, kept it back; a poor crop this year.

8. Potatoes—very promising now, and no appearance of disease yet, September 12.

9. Peas—but few grown in this county.

10. Beans—late spring frosts cut some; but few grown; look promising at present. My Lima beans are, now, my greatest table luxury, and growth very abundant, and ten days will put them out of way of frost. No more trouble to raise this rich, superior bean, than any common kind, from three years' experience.

11. Hay—one and a half tons; one-half to two-thirds crop; affected by the cold weather; an insect is said to be injuring timothy some; cold, backward, unfavorable spring, affected crop seriously. Portions of my timothy meadows grew ten inches high, and never headed; leaves dry when cut.

12. Fruit—apples better than usual; more apples shipped from this county than ever before; no peaches; but few plums; grapes not so good as last year; pears better.

13. Had wheat growers not been looking for the midge, no notice would have been taken of the almost imperceptible effects of the midge in Wayne county, this year, in fields which had received timely and proper cultivation, and of appropriate wheat soil; some low, late sown fields, have been injured; the "INSECT" has not been spoken of in my hearing, this season, as doing any damage.

14. Drained lands have been much less affected by wet and drouth, than undrained lands; strong crops are growing upon drained lands in this town, which would yield nothing but *frogs*, and wild, good-for-nothing plants, in a state of nature.

15. We claim for Wayne county, that her progression is in the right direction; but since the midge has affected our great farmers staple, we are yet in a state of experimenting uncertainty, by which it is hoped, ere long, to learn the best method of obtaining, from our rich soil, such remuneration for cultivation, as it is capable of producing.

WYOMING COUNTY.

E. L. BABBITT.

1. Winter wheat—twenty-five bushels; quality good, and much better than usual; but little raised in the county; no disease affected the wheat this year; last year the weevil nearly destroyed the wheat, so that but little was sown.

2. Spring wheat—fifteen bushels; fair quality; better than usual; more than usual yield; more than ever was raised in the county; no disease; a great breadth was sown, and there has been a first rate yield.

3. Corn—too early to tell how it will turn out; a much larger breadth planted than usual; frost injured the corn; some pieces were plowed up and then sowed to corn; there is a large crop of sowed corn in this county.

4. Rye—fifteen bushels; good quality; more sowed than in former years; grasshoppers injured the crop in the western part of the county.

5. Barley—twenty bushels; first rate quality; about the usual breadth sown; but will yield more per acre; crop injured by grasshoppers.

6. Oats—thirty bushels; good quality; much larger than the usual yield; one-third at least; grasshoppers hurt the crop some.

7. Buckwheat—it looks well now; promises to be a much larger crop than usual; will be better than former years, if frost holds off two weeks.

8. Potatoes—They look well, but were injured by the June frost; there is, as yet, no appearance of disease. If they escape the rot there will be a better crop than usual, notwithstanding the injury by the frost.

9. Peas—Fifteen bushels; good quality; usual yield; there are but few raised.

10. Beans—They look well; more planted than usual.

11. Hay—The frost in June ruined the hay crop in the west half of this

county, where it would formerly average one and one and a half tons per acre. This year it will not yield 400 lbs. per acre; it is almost a total failure; there are hundreds of acres of first quality meadow land that will not be cut at all. Take the county through, I don't think it will yield 700 lbs. per acre. It is very light in every part of the county.

12. Fruit—In about one-third of the county, the fruit was entirely destroyed by frost; where it escaped the frost, cherries were in great abundance, plums but few, peaches none, pears good, grapes but few, and apples first rate where they were not cut off. Orchards are loaded that escaped.

13. Wheat has been but very little affected by the midge; the early wheat escaped entirely. There was but little sowed in the county.

14. I believe it is the almost universal opinion of farmers here, that drained lands are neither affected by the wet or drouth as much as undrained.

15. There has been a great improvement in farming in our county. Deep plowing, draining, and the introduction of labor saving machines, with the very general diffusion of agricultural journals, have done much to improve farming; stock has also much improved.

SURVEY OF ONONDAGA.

To the Executive Committee of the N. Y. State Agricultural Society :

In obedience to your request, I have drawn up, for the use of our Society, a report on the county of Onondaga ; I have endeavored to follow the plan furnished me by you, so far as the same appeared applicable to this county. The object has been to determine facts, and to state them in the simplest form practicable—avoiding the discussion of theories, except in cases that did not allow of the facts being determined with certainty. I have freely availed myself of the labors of others who have gone before me, in all of the branches of the subject in hand. Credit will be found given in notes, in various places, to the authorities consulted ; and I have received valuable aid from various persons, to whom I desire to return my thanks. I am particularly indebted to Mr. W. M. Beauchamp, of Skaneateles, for a list and description of troublesome weeds ; to Mr. Chester Moses, of the same place, for information in regard to the cultivation of teasels ; to Mr. Benjamin Clark, of Marcellus, and Col. Mars Nearing, of Brewerton, for information in regard to the cultivation of tobacco ; and to Prof. James Johonnot, of Syracuse, for the particulars of the free schools of that city.

The topographical and geological map, that accompanies this report, has been made with care, intending to show, as accurately as practicable on so small a scale, the dividing lines between the various geological formations, and to locate the hills as they really exist. The heights given in the geological section, have been determined correctly by a level used under my direction by H. W. Clarke, C. E. The hills, and many of the small streams, have been determined by H. D. L. Sweet, topographical engineer, by actual survey. It is not intended to say that there are no errors in this map, but that an attempt has been made to get as near accuracy as practicable, with the time and means at my disposal.

The great object, in the whole work, has been to make it useful ; originality is not claimed ; in fact, I consider myself as but the compiler, rather than the author of the report. It is not put forth to enlighten scientific men ; to such, it will appear but a small matter ; but to assist our farmers in that advancement of their interests they are seeking. With these few preliminary remarks, the report is submitted for your consideration.

FAIRMOUNT, Onondaga Co., N. Y., *Feb.*, 1860.

GEO. GEDDES.

The committee to which was referred the survey of Onondaga county, as made by the Hon. George Geddes, beg leave to report :

That they have had the same under consideration, and through the courtesy of Mr. Geddes, nearly the whole report has been read to them during the time spent at the annual meeting.

The county of Onondaga, from its geographical position, as well as from

its peculiar topography, possesses especial interest. In its geology may be studied the rocks and consequent soils which characterize the general cultivation of a large number of the counties lying west and southwest therefrom. So diversified is the county, that a survey of several towns will serve as a history of the agricultural condition of those counties whose agriculture is therein represented. It may be divided into three sections, from east to west; each division being distinctly marked, as well by the rocks that underlay it, as the timber and agricultural productions most congenial to the soil.

The committee, after referring to the different geological sections, into which this county may be divided, which are carefully described in the survey, remark :

Hence, if an agricultural survey of this county could be made by a competent person, familiar with its diversified soil and cultivation, and able to place before the reader, in a clear and intelligent manner, the facts most important for comprehending the true condition of the farmers, as well as their best modes of cultivation, we should have a report in reality, covering an area of about one-fourth of the State, or nearly twenty of its most important counties.

From his large experience as a practical farmer, and being a native of the county, "to the manor born," and thus from his boyhood familiar with its agricultural and industrial progress, Mr. Geddes seems to be pre-eminently fitted for the task, which this survey will show to have been so ably and faithfully performed.

Though each chapter contains valuable matter that could not well be omitted, yet the committee would commend that upon "Practical Agriculture," as one well worthy the especial study and consideration of any farmer.

While the committee gladly bear witness to the great value of the report or survey, and to the intelligent industry displayed in its preparation, making it a model that others may imitate to advantage, yet they are constrained to say that but for the vast amount of desirable historical knowledge in regard to the Indians, which is found in no other work in so compact and accessible form, they should have been unwilling to allow the publication, in our Annual Transactions, of subjects which more properly belong to the historian than the agriculturist.

The committee take great pleasure in recommending the acceptance of the survey, and its publication in the Transactions of the Society.

Inasmuch as it is understood that the sum allowed to Mr. Geddes for this survey, has been nearly or quite absorbed in the expenses incident to its preparation, for surveys, engravings, and topographical surveys and drawings; and from the fact that he relinquishes to the Society his claim to the copyright, the committee advise that the Society make him some suitable testimonial of their appreciation of his labors. To that end they recommend that plate, to the amount of \$100, bearing suitable inscription, be awarded to him.

WILLIAM KELLY,
T. C. PETERS,
EDWARD G. FAILE.

ALBANY, Feb. 8th, 1860.

INTRODUCTION.

IN gathering the materials for a report on the industry of Onondaga county, which was to be prefaced by some account of its early settlement, it seemed desirable to determine who was the first European that visited it. In settling this point many volumes were consulted, and many interesting facts in regard to the Aborigines were learned, that gradually mingled in the mind of the writer, with things before known by him, and assuming form and method, the whole subject at last took the shape in which it appears in the Introduction. A report on the agricultural and general industry of a county, certainly does not call for a history of the savages who once hunted and fished within its boundaries, and it was no part of the original purpose to attempt any such matter; but once interested in the subject, it was pursued to the end. In this form the whole report was submitted to the committee of the society, and by them the Introduction, as well as the Report, was ordered printed.

The first settlers of Onondaga found in possession the remnants of a once powerful race of men, whose ancient renown deserves preservation by us who now possess the burial places of their fathers. These Indians, as their conquerors, have insisted on calling them, had no written history, their deeds of arms, and the decisions of their councils, being preserved only by their traditions, and by strings of beads, belts of wampum, and other mysterious symbols, that, during their savage state, were carefully preserved, and transmitted from generation to generation. They are themselves losing all knowledge of their own past history, and very soon there will be nothing preserved, except what may suit the conqueror to say of them. This being so, it perhaps will not be considered out of place here to try and group, in a very condensed form, such portions of their history as may particularly appertain to the Onondaga family.

The traditions of this people fix their origin at the Falls of the Oswego. Ondiyaka, who died in 1839, at the age of ninety, believed this tradition, saying to Le Fort, who succeeded him as ruling Chief, that they were created by Neo (God) where they lived, and he said, as he walked over the ruins of ancient forts in the valley of the Kasonda (Butternut creek), this was the spot where the Onondagas formerly lived before the confederation. In those times the tribes went to war with each other, and it is probable that the ancient forts found in Central New York, which were evidently made before any white man had come here, owe their origin to these wars, and were built for protection against savages like themselves.* After the confederation of the five nations, these fortifications being no longer necessary, they fell into decay, and now, where the forest remains to protect the circular or ring works, we find large trees on their earth walls.

The term Iroquois has been given by the French as the national name for this people, and by it they are now everywhere known. They called themselves *Ongwe Honwe*, or a people surpassing all others. The name they gave to the confederacy was KONOSHONI, UNITED PEOPLE. There are no means of knowing the pre-

* Schoolcraft's Report; Senate Doc. 24, 1846, page 29.

cise date of their confederating into one people. Schoolcraft thinks it was a comparatively recent act, but probably early in the fifteenth century; their own traditions carry it far back to wars with giants and demons.

The Iroquois confederacy consisted of five nations, viz., the central, known as the Onondaga, with which was intrusted the keeping and holding of the councils; the Cayugas and the Senecas, on the west, and the Oneidas and Mohawks on the east. The Senecas, in their expressive language, kept the west door, and the Mohawks the east door of their long house, stretching from the Hudson to the lakes, a distance that now requires three hundred and twenty-five miles of railroad to measure. This was the seat of their power, but was by no means the limit of their territorial possessions. The confederacy was governed by hereditary chiefs, whose claims were subjected to the decision of a national council. Thus the aristocratic principle was brought into subjection to the democratic. When the hereditary chief demanded office, if found unworthy, he must give place to the next in order. In council they were a pure republic, the veto of one chief was sufficient to defeat a measure.* Each canton or tribe was independent; its quota of men was freely voted in war, or refused, without complaint from other cantons; thus was guaranteed to each tribe its independence and security, and to each warrior his equal rights, while general power was conceded to the confederacy in all national matters. In 1774, Canassatego, one of the chiefs, said to the commissioners of Pennsylvania, Virginia and Maryland: "Our wise forefathers established union and amity between the Five Nations. This has made us formidable. This has given us great weight and authority with our neighboring nations. We are a powerful confederacy, and by observing the same methods our forefathers have taken, you will acquire fresh strength and power; therefore, I counsel you, whatever befalls you, never fall out with one another."

The traditions of the tribes all agree in the origin of the confederacy, and that the council forming it was held on the shores of lake Oh-nen-ta-ha (Onondaga). The right of the Onondagas to furnish a presiding officer for the league was conceded, and is still possessed by them. To the Mohawks was awarded the Te-ka-ra-ho-gea, or chief war captain. At the formation of the confederacy, the famous A-to-tar-ho presided; unequalled in war and arts, his fame had spread abroad, and exalted the Onondaga tribe to a pre-eminent position. His name is "like that of King Arthur of the Round Table, or those of the Paladins of Charlemagne, used as an exemplar of glory and honor,"† and has become the title of office of the presiding chief. The great council has always consisted of six members, each nation having one, except the Senecas, who were allowed two, in consideration of their greater numerical strength. Its powers were merely advisory, aiming to arrive at harmonious results, by interchange of opinion without formal vote. No penalties could be inflicted, or power exerted beyond that of opinion. A unanimous decision was first required; this once obtained, its authority was absolute, each tribe acting through its representative, who was first informed as to its views. These decisions were in fact clothed with all the power of the most popular expression of the whole confederacy.

A government like this gave to the orator, who by his eloquence could sway his people, a vast influence, and we find that many men of note have appeared among them since they came in contact with more learned races of men, who were abundantly qualified to conduct their negotiations, and have reflected as much renown on their nation as their bravest warriors.

* Schoolcraft; same doc., p. 31.

† Schoolcraft.

The unwritten law of this wonderful people had a power unequalled by any statutes ever recorded in books. A single instance of its power will be sufficient. It is given on the authority of Mr. Webster, who lived many years among the Onondagas, and had a woman of that tribe for a wife.

A young man of the Cayugas came to Onondaga and claimed their hospitality. He lived among them two years, attaching himself to Webster particularly. He appeared contented and happy, "always foremost in the chase, most active in the dance, and loudest in the song." Mantinoah was his name. One morning he said to his friend, "I have a vow to perform; my nation and my friends know Mantinoah will be true. My friend, I wish you to go with me." Webster consented. After a pleasant journey of a few days, enlivened with fishing and hunting, they came, in the afternoon, to a place that Mantinoah said was near his village, and where he wished to invoke the Great Spirit. After a repast, and the pipe had been smoked, Mantinoah said, "two winters have gone since, in my village, in the fury of anger, I slew my bosom friend and adopted brother. The chiefs declared me guilty of my brother's blood, and I must die. My execution was deferred for two full years, during which time I was condemned to banishment; I vowed to return. It was then I sought your nation; it was thus I won your friendship. The nearest in blood to him I slew, according to our customs, is the avenger. The time expires when the sun sinks behind the topmost boughs of the trees; I am ready. My friend, we have had many a cheerful sport together; our joys have been many; our griefs have been few; look not sad now. When you return to the Onondagas, tell them that Mantinoah died like a true brave of the Cayugas; tell them he trembled not at the approach of death, like the coward pale face, nor shed tears like a woman. My friend, take my belt, my knife, my hunting pouch, my horn, my rifle, as tokens of my friendship. Soon the avenger will come; the Great Spirit calls; Mantinoah fears not death; farewell." Vainly Webster urged him to escape. A short period of silence, and a yell is heard. Mantinoah responds. The avenger appears and takes the hand of his former friend, now his victim. Mutual salutations follow, with expressions of regret made by the executioner, but none by the doomed. The tomahawk gleams in the air, not a muscle moves, nor does the cheek of Mantinoah blanch, folding his arms on his breast, he receives the blow. As if by magic a host appears; the song of death is sung, and the solemn dance or death march is performed. Webster is invited to the village, where he is hospitably entertained, and when ready to return is accompanied by a party of Cayugas to his home.*

Thus powerful was the unwritten law of the Iroquois.

It is not easy for us to understand this people, for we know but little of their peculiar springs of action. They had their religion, which the white men that came in contact with them called their superstition. If superstition it be, it was nevertheless the principle that governed them; and did we but understand their ideas fully, we should know by what standard to judge them. Whoever has learned much of their history, knows that in their savage state, woman made prisoner, was never indelicately approached by him, who, without pity, would brain her infant child. The reason was, that it would have been a complete desecration for a brave to entangle himself by a more tender sentiment than war, and should he do so he would subject himself to the contempt of his fellows.†

He tortured and killed his prisoners, if he did not adopt them into his family, but he never enslaved them, nor outraged women. What other nation can say this with truth?

* Clark's Onondaga.

† Schoolcraft.

Mr. Schoolcraft says, that to understand the government, and learn how it acquired so much power and fame, it is necessary to examine the law of descent. Each canton was divided into distinct clans, each of which is distinguished by the name and device of some quadruped, bird, or other object in the animal kingdom.

It was contrary to their usages that near kindred should intermarry, and the ancient rule interdicts all marriages between persons of the same clan. The population is separated into eight clans or original families, who are distinguished respectively by the *totems* of the wolf, the bear, the turtle, the deer, the beaver, the falcon, the crane and the plover. They must marry into clans whose totem is different from their own. A wolf or turtle male cannot marry a wolf or turtle female. There is an interdict of consanguinity. By this custom the purity of blood is preserved, while the tie of relationship between the clans is strengthened or enlarged. By far the most singular principle connected with totems, is the limitation of descent exclusively to the line of the female. Owing to this prohibition the chieftain's son cannot succeed him in office; but in case of his death he would be succeeded by his brother, or failing in this, by the son of his sister, or by some direct, however remote descendant of the maternal line. Thus no man, however distinguished in war or council, can establish a family or transmit the power he has acquired to his descendants. The man who, by inheritance, is entitled to the honors of chieftainship must, on arriving at the proper age, submit his right to the decisions of a council of the whole canton. If approved, he is formally installed in office. Incapacity is always and without exception recognized as a valid objection to approval.

Each canton had its eight principal chiefs, and various assistant chiefs. These were civil officers. The war chiefs derived their consequence from their success in war, and rose up as the exigencies of the nation demanded, and sustained themselves by their capacity. All males were, by the unvarying usage, bound to render military service. Disgrace was the penalty for a failure to obey the usage. Thus the ranks were always full, and all war parties consisted of volunteers. No title was so honored as *Roskeahragehte*, or warrior. Each warrior supplied and carried his own arms and provisions. The enlistment consisted simply in joining the war dance. No measure, though adopted by the civil and war chiefs, could be carried out unless sanctioned by the fighting men, if it involved war. Thus, in fact and in practice, the government became a pure democracy, controlled by its martial spirit.

The strangest feature of the government yet remains to be mentioned. This was the power of the women. From the earliest time this power has existed, and through all changes has been preserved to this day. There was a male functionary, an acknowledged orator, whose duty it was to speak for the women. The matrons sat in council, and had the right to propose a cessation of arms; and a proposition from them could be made without compromising the character of the tribe for bravery. Councils so organized were swayed by popular will, and eloquence found an ample field for the display of its noblest powers.

The Iroquois have been charged with making their women beasts of burden, while they lived lives of indolence. The division of labor between the sexes, it is true, differed widely from ours. To the warrior was assigned the duty of hunting food, and protecting his hunting grounds from inroads of the enemy. His life was daily in his hands, and such were the hazards he encountered, that there were more women than men always to be found in the tribes. He spent a long and dreary hunting season in taking furs, which, when brought home, became the property of his wife, who took them to the traders, and with the avails made such

provision for him and the rest of the family as she could, he standing silently by not uttering one word. The women, old men, and boys, cultivated the little patch of corn and gathered the fuel. The warrior fights the battles of his nation, provides the meat for his lodge, and hunts the fur bearing animals to purchase what perhaps he calls luxuries. "In the lodge he is a mild considerate man, of the non-interfering and non-scolding species. He may, indeed, be looked upon rather as the guest of his wife, than what he is most unjustly represented to be, her tyrant, and he is often only known as the lord of the lodge by the attention and respect which *she* shows to him. He is a man of few words. If her temper is ruffled he smiles. If he is displeased he walks away. It is a province in which his actions acknowledge her right to rule; and it is one in which his pride and manliness have exalted him above the folly of altercation."* The wife owned all the property; arms only belonged to the husband; the family was hers, and when war or the chase had made the father its victim, she who had always been its head kept it unbroken. The hazards the men must encounter were such as to render it but a prudential measure, that the women should be the owners of the family property. The divisions of labor, power and consequence, are easily traced to the sources they grew out of, and were necessary to the condition of the people. The ferocity of the savage was strangely united with a deference for woman, not surpassed by the knights of the days of Richard Coeur de Lion; but space cannot be given to a full investigation of the inner life of this people. We must proceed to the narration of their history since they have come in contact with Europeans.

The central tribe was the seat of government, and here all the general councils were held, and all the policy of the nation settled. The first we know of this people they here swayed the sceptre of an empire twelve hundred miles long and eight hundred wide. The means of free and rapid transportation of armies was to these savages of the same advantage that it is to the most artificial state of society. Around the shores of Onondaga lake the councils deliberated, and when once the plan of the campaign was arranged, the canoes were afloat, and soon far down the St. Lawrence the Adirondac heard the war whoop of the "men of the mountain."† Or on the banks of the Georgian bay the trembling Huron felt the weight of their power. Or launching their barks on the head waters of the Susquehanna, soon on the shores of the Chesapeake bay they dictated terms to their enemies. Their power was felt and acknowledged as far south as the country of the Cherokees. Fort Hill, in South Carolina, afterwards the residence of John C. Calhoun, was one of their stations, from which they waged inveterate war against the Catawbias and Cherokees.

The Iroquois nation could bring to a battle field more than two thousand warriors of their own blood, besides their levies from the tribes they had subjected. Their policy in regard to conquered enemies was like that of ancient Rome; they were converted into allies rather than slaves, and having been fairly conquered in war, after a brave resistance, they were counted as younger brothers, worthy to fight by the side of their conquerors, and partake of their glory. Thus the confederacy grew until it dictated the policy of all that part of the continent that reaches from the Hudson river to beyond the Mississippi. With the Iroquois war was the business of life, and the pursuit of an enemy on the war path, or hunting the wild beasts of the forest, were the only employments that men could engage in without subjecting them to the loss of rank, and the liability of being called women. "They reduced war to a science, and all their movements were directed by system and policy. They never attacked a hostile country until they had sent

* Schoolcraft.

† Meaning of the word "Onondaga."

out spies to explore and designate its vulnerable points, and when they encamped they observed the greatest circumspection to guard against surprise. Whatever superiority of force they might have, they never neglected the use of stratagem; they employed all the crafty wiles of the Carthagenians. The cunning of the fox, the ferocity of the tiger, and the power of the lion, were united in their conduct. They preferred to vanquish their enemy by taking him off his guard, by involving him in an ambuscade, or by falling upon him in the hour of sleep; but when emergencies rendered it necessary for them to face him on the open field of battle, they exhibited a courage and contempt of death which has never been surpassed. Like other savage nations they delighted in cruelty. To produce death by the most protracted sufferings was sanctioned by general and immemorial usage.”*

The Europeans, instead of teaching mercy to these men, encouraged and fostered the worst points in their characters, and by every temptation they were led on to become even more cruel, as they became demoralized and vicious by intercourse with the more learned and less principled “pale face.” Massachusetts gave, first twelve, then forty, and finally one hundred pounds for a scalp. The Colonial Legislature of New York, in 1745, passed an act for giving a reward for scalps, and in 1746 a governor of the colony not only paid for two scalps of Frenchmen in money and fine clothes, but thanked the three Indians that brought them to Albany, and promised to “always remember this act of friendship.”*

When the French first commenced the settlement of Canada in 1603, they found the Adirondack Indians settled, where Quebec stands, to which place they had been driven from their former homes by the Iroquois. Mons. Champlain, the governor, joined the Adirondacks with his Frenchmen to invade the country of the Iroquois. On the lake which now bears his name, Champlain met two hundred of them; both sides went on shore for the battle, and then, for the first time, the sound of musketry was heard by the Iroquois. Defeat followed, and wondering and dismayed by the murderous effects of the new weapon, they retreated to their fastnesses in the wilderness. This was their first interview with white men, and their first knowledge of them was obtained by meeting them as enemies in a battle, where they turned the scale against a people with whom they certainly had no pretense of a quarrel. This affair is supposed to have occurred in 1609.†

The next the Onondagas saw of Europeans was on the 9th of October, 1610. A fishing party on their way to Oneida lake, were surprised by a company of Adirondacks and French under Champlain. These invaders had made their way up the St. Lawrence to the lower end of Lake Ontario, where hiding their canoes, they struck across the wilderness on foot. They took captive of the Onondagas, “three men, four women, three boys and a girl.” They then marched forward, and says Champlain in his account, on the 10th of October, at 3 P. M., “we arrived before the fort of the enemy. When I approached with my little detachment, we showed them what they had never before seen or heard. As soon as they saw us, and heard the balls whistling about their ears, they retired quietly within their fort, carrying with them their killed and wounded. We also fell back upon the main body, having five or six wounded, one of whom died.”†

Mons. Champlain, governor of Canada, representative not only of a great monarchy, but of christianity, what moves you to this wanton attack on a people of whom you know nothing, except what you hear from their enemies, and with whom you certainly have no cause of quarrel? This act of wanton injustice will return upon you and the nation you represent.

* Clinton.

† Clark's Onondaga.

After a six day's seige, this mighty governor general, in the midst of his French and Indians, wounded in two places by Onondaga arrows, is ingloriously retreating, carried in a "basket of wicker work, so doubled up and fastened with cords that he was unable to move." A long and dreary winter is passed by Champlain among the Hurons before he can get back to Quebec; but the war he has commenced will only end with the extinction of the French power in Canada. Truces will be made: they are but armistices of short continuance. The Iroquois will be seen, armed with powder and ball, by the Dutch and English, on every battle field henceforth, until on the plains of Abraham, Onondaga chieftains will shed their blood as freely as Wolfe, while vengeance is glutted.

In the events that immediately ensued, we follow Bancroft, using his language when most convenient: "Thrice did Champlain invade their country, until he was driven with disgrace from their wilderness. The Five Nations in return attempted the destruction of New France. Though repulsed, they continued to defy the province and its allies, and under the eyes of its governor openly intercepted convoys destined for Quebec. The French authority was not confirmed by founding a feeble outpost at Montreal; and Fort Richelieu, at the mouth of the Sorel river, scarcely protected its immediate environs. The Iroquois warriors scoured every wilderness to lay it still more waste. Depopulating the whole country on the Ontario, they obtained an acknowledged superiority over New France. The colony was in perpetual danger, and Quebec itself was besieged." From these straits the French sought to relieve themselves by the assistance of missionaries, of a religion whose precepts they had so wantonly violated, and in 1646 "Father Joque, commissioned as an envoy, was hospitably received by the Mohawks, and gained an opportunity of offering the friendship of France to the Onondagas." The first Frenchman came with the sword, the second with the cross.

The history of the actions of the Jesuit missionaries among these tribes, is but a constant repetition of ennobling examples of disinterested, self-sacrificing devotion to the great cause of leading the barbarians to the cross. No hardship was too great, no suffering too severe, martyrdom itself was received willingly; and when one was consumed by the fires of the savages, another stood ready to take his place.

The Iroquois were satisfied with blood, and desired rest. Peace was concluded, and in 1654 Father Le Moine appeared as an envoy to the Onondagas, to ratify there the treaty Chaumonot and Claude Dablon followed in 1655. They were "hospitably welcomed at Onondaga; at once a chapel sprung into existence, and by the zeal of the natives was finished in a day, and there, in the heart of New York, the solemn services of the Roman church were chanted as securely as in any part of christendom."

This happy state of things was interrupted by an attempt on the part of the French to establish a colony. May 7th, 1656, a company of fifty Frenchmen embarked for Onondaga, making a home on the shores of the lake, and encountering the forest with the ax, suffered from fever before they could prepare their tenements. Border collisions ensued; the Oneidas murdered three Frenchmen, and the French retaliated by seizing Iroquois. At last, when a conspiracy was formed in the tribe of the Onondagas, the French, having vainly solicited re-enforcements, abandoned their chapel, their cabins and their hearths, in Onondaga, and their settlements in the valley of the Oswego. The Mohawks compelled Le Moine to return, and the French and Iroquois were, in 1659, once more at war."

"The harvests of New France could not be gathered in safety, the convents were insecure, many of the inhabitants prepared to return to France. In moments

of gloom it seemed as if all must be abandoned. True, religious zeal was still active. Le Moine once more appeared among the Five Nations, was received with affection at Onondaga," and peace followed.

The New Netherlands became the property of England, and then commenced negotiations to procure the friendship of these savages of the interior. England and France for twenty-five years sued with uncertain success, "yet afterwards in the grand division between parties throughout the world, the Bourbons found in them implacable opponents." In 1684, the Five Nations met the governor of New York at Albany, and the Sachems returned, to nail the arms of the Duke of York over their castles, a protection, as they thought, against the French, an acknowledgment, as the English deemed, of British sovereignty."

The Governor of Canada, meantime, "with six hundred French soldiers, four hundred Indian allies, four hundred canoes, and three hundred men for a garrison," started for Onondaga; but the army suffered by sickness, and after arriving on the soil of the Onondagas, he was constrained to ask for peace. The English desired the Five Nations to take advantage of the condition of the French and exterminate them; but this was not the policy of the Indians; they did not desire to entirely ruin the French, and thereby entirely relieve the English from them, but rather to play one party off against the other, while they kept to themselves the balance of power. They had, by this time, come to think that it would not be wise for them to be entirely in the power of any race of white men.

The interference of the English was resented, and an Onondaga chief proudly exclaimed to the envoy of New York, "Onondio (the French Governor) has for ten years been our father; Corlear (the English governor) has long been our brother, but it is because we have willed it so; neither the one or the other is our master; He who made the world gave us the land in which we dwell; we are free; you call us subjects; we say we are brethren; we must take care of ourselves; I will go to my father, for he has come to my gate, and desires to speak words of reason; we will embrace peace instead of war; the ax shall be thrown into a deep water."

Haaskouaun, the chief, said to De la Barre, the French commander: "It is well for you that you have left under ground the hatchet which has so often been dyed in the blood of the French; our children and old men had carried their bows and arrows into the heart of your camp, if our braves had not kept them back; our old men are not afraid of war; we will guide the English to our lakes; we are born free; we depend neither on Onondio nor Corlear." Dismayed the proud governor of Canada accepted a disgraceful peace, abandoning his Indian allies to the tender mercies of the Iroquois.

This conduct of the Iroquois, in allowing a large army to depart in peace, that had invaded their country to destroy it, and that had fallen completely in their power, certainly deserved some grateful remembrance from the French nation. We shall soon see how this act of mercy was returned.

In 1686, the French established a fort at Niagara; this gave great dissatisfaction to the English, for it was within the country of the Iroquois, and as against France, England claimed to be the owner of all their territory. The French, following the European rule, claimed all the country drained by the St. Lawrence as their property, by right of discovery, and occupancy of the mouth of the river.

The establishment of Fort Niagara was therefore a matter of great importance to both these nations, claiming land to which neither had any valid title. This was the beginning of the contest between these parties for territory in the west. The boundary line between them never was settled, but for the present the Five

Nations were a barrier that kept apart the two competitors who were striving for the dominion of the continent.*

In 1684, De la Barre had been mercifully allowed to withdraw his sickly army away from the valley of the Oswego. Now for the return of French gratitude. Louis XIV. writes to the governor of New France: "the welfare of my service requires that the number of the Iroquois should be diminished as much as possible. They are strong and robust, *and can be made useful as galley slaves*. Do what you can to take a large number of them prisoners of war, and ship them to France." By open hostilities no captures could be made; and Lamberville, the missionary among the Onondagas, was unconsciously employed to decoy the Iroquois chiefs into the fort on Ontario. Invited to negotiate a treaty, they assemble without distrust, are surprised, put in irons, hurried to Quebec, and thence to France, where the warrior hunters of the Five Nations, who used to roam from Hudson's Bay to Carolina, were chained to the oar in the galleys of Marseilles.† This was in 1687.‡

What will the outraged Iroquois do with this missionary, the unwitting tool of tyrants? The narration continues: "Meantime the old men of the Onondagas summoned Lamberville to their presence. 'We have much reason,' said an aged chief, 'to treat thee as an enemy, but we know thee too well; thou hast betrayed us, but treason was not in thy heart; fly, therefore, for when our young braves shall have sung their war song, they will listen to no voice but the swelling voice of their anger.'" Trusty guides conducted the missionary through by paths into a place of security. This noble forbearance was due to the counsel of Garonkonthe. Generous Barbarian! exclaims Bancroft, your honor shall endure, if words of mine can preserve the memory of your deeds.§ This generosity was not suggested by fear, but grew out of love of justice. The innocent instrument of the wrong must not suffer for his sin of ignorance, but vengeance must be visited on the really guilty. HAASKOUAUN advances with five hundred warriors to dictate terms of satisfaction. "I have always loved the French," said the proud chieftain to the foes he scorned; "our warriors proposed to come and burn your forts, your houses, your granges, and your corn, to weaken you by famine, and then to overwhelm you. I am come to tell Onondio he can escape this misery, if within four days he agrees to the restoration of the chiefs and spoils, and the abandonment of the fort at Niagara." Twelve hundred warriors are afloat on Lake St. Francis, and in two days they will be in Montreal. The haughty condescension of the chief was accepted, the restoration of the imprisoned chiefs conceded, and the whole country south of the lakes rescued from the dominion of Canada. In the course of events New York owes its present northern boundary to this exhibition of the power and valor of the Five Nations.† All but a little corner of this county of Onondaga is drained into the St. Lawrence, and but for these Indians must have formed a part of Canada.

M. de Nonville called an assembly of the chiefs of the Five Nations at Montreal. On their way they are waylaid by Adario, the great chief of the western tribes, and an ally to the French. The ambassadors, with their guard of forty warriors are surprised, and either killed in battle or made prisoners. They naturally supposed that Adario acted in accordance with French wishes; this opinion the wiley savage strengthens by charging the treachery directly on De Nonville; dismissing his prisoners with presents, and threatening revenge for having been made a tool, the point is settled in the minds of the Iroquois, and vengeance follows. On the 12th of July, 1688, twelve hundred warriors are before Montreal, the town is

* Bancroft, vol. 2, p. 422.

† Bancroft, vol. 2, p. 423.

‡ Bancroft, vol. 2, p. 423.

§ Bancroft, vol. 2, p. 424.

burned and sacked, and over one thousand French lives are sacrificed.* The war went on until "none could plant or sow, or pass from one place to another without danger of being killed by a skulking foe." In 1691, Kan-ah-je-a-gah, at the head of his six hundred braves, "overran the country as the sweeping torrent does the lowly valley."

This Kan-ah-je-a-gah, whom the English called "BLACK KETTLE," was an Onondaga chief; he acted, in concert with Major Peter Schuyler, in 1690, at the head of his Mohawk and Onondaga followers, in resisting the French on the shores of Lake Champlain, and he defeated the French near Niagara; the next year he was in Canada. His successes so exasperated the governor, "that he caused a captive whom he had taken from the Indians to be put to death with the most excruciating tortures. The poor victim endured the infliction with stoical indifference, singing his achievements while they burned his feet and hands with hot irons, cut and wrung off his joints, pulled out his sinews, and to render the hellish tragedy complete, tore off his scalp and poured hot sand on his naked skull." This did not intimidate, but it awakened the vengeance of KAN-AH-JE-A-GAH, and the Senecas and Onondagas under his lead were soon on the war path. "They intercepted all trading parties from Montreal to the upper lakes, securing booty and carrying terror and dismay into the heart of the French colony. In 1692 he carried his arms to the very citadel of Montreal. He continued the war with success until 1697, when he was decoyed into Canada by the perfidy of the French, under the pretext of a desire to make peace. With about thirty of his warriors he was unexpectedly fallen up by a party of Algonkins, engaged by the French for the work. After he had received his death wound, he cried out: "Must I, who have made the whole earth tremble before me, now die by the hands of children?"†

The old French game; propose a conference and murder or make prisoners the ambassadors. This was easier than to slay them in battle. Why after such experiences would the Indian trust to christian men's faith? It became a proverb among them that white men spoke with a "forked tongue." In more modern days Florida chiefs were made prisoners by trusting the words of one of our generals. The dastardly betrayal and death of Osceola are recorded in history to our nation's shame.

The Indians have found all the civilized nations with which they have come in contact alike destitute of that truth that was one of the characteristics of the forest, and they have been unable to comprehend the treachery to which they have so often fallen victims.

But to return to our narrative, as years rolled on the Iroquois became more and more friendly with the English, and from time to time received assistance in men and arms.

In 1694, the great chief DE-KAN-IS-SO-RA visited Montreal to make peace with the French; he returned with the information that they would only make peace upon condition that they should be permitted to build a fort and keep a garrison at Cadaraqui (now Kingston), and that the English should not be encouraged to trade with the Canadian Indians, threatening the Five Nations with utter destruction in case of their refusal of these terms.‡

Canada was then governed by Count de Frontenac, who resolved to put the whole power of the French in requisition, and by a decisive blow bring the Onondagas to terms. In 1696 he mustered the whole force that France could furnish, and that the province could raise, together with such Indian allies as he could

* Clark's Onondaga, vol. 1, p. 269.

† Clark's Onondaga, vol. 1, p. 89.

‡ Clark's Onondaga, vol. 1, p. 277.

enlist. On the 4th day of June the army embarked at La Chine, in boats, and commenced the long journey. Four battalions of regulars and four of militia, with the vast army of Indians, made their toilsome ascent of the river St. Lawrence, coasted along the shores of Lake Ontario, and then ascended the Oswego. Nearly two months were thus consumed, and it was not until the second day of August that the flotilla was on Lake Oh-nen-ta-ha (Onondaga).*

Hoffman says of this army, that "banners were there which had been unfurled at Steenkerk and Landen, and rustled above the troops that Luxemburgh's trumpets had guided to glory, when Prince Waldeck's legions were borne down beneath his furious charge. Nor was the enemy this gallant host was seeking unworthy those whose swords had been tried in some of the hardest fought fields of Europe. They had bearded a European army under the walls of Quebec, shut up another for weeks within the defences of Montreal, with the same courage which half a century after vanquished the battalions of Dieskau on the shores of Lake George."†

The French, with their allies, passed through the lake in two divisions, skirting both shores, and finally landed at the east end, sword in hand. On the 3d of August they constructed a fort, and left a garrison of 140 men to guard their bateaux and baggage. This fort was probably at the place now called Green Point, as the next day the French account says "inconceivable difficulty was experienced in moving the cannon and the remainder of the artillery equipments over marshes, and two pretty considerable rivers which it was necessary to traverse." They encamped the next night at the place of the Salt Springs. This French army had been observed by scouts, and all its movements and its force were well known at the Onondaga villages. No assistance could be had from the English, and resistance was idle to the vast army that, with well supplied artillery, was now before them. The Onondagas resolved to bend before the storm they could not face. On the night of the 2d of August, the French saw the light of immense fires in the south. The Indians were destroying their own property, preferring this mode of defence to direct resistance. When the French arrived on the ground, Frontenac says they found "the cabins of the Indians, and the triple palisades which encircled the fort, entirely burnt. It has since been learned that it was in a sufficiently strong state of defence. It was an oblong, flanked by four regular bastions. The two row of pickets which touched each other were of the thickness of an ordinary mast, and at six feet distance outside stood another palisade of much smaller dimensions, but from forty to fifty feet high."

The 7th, 8th and 9th days of August were spent by the French in destroying the young and growing corn. "The grain was so forward that the stalks were very easily cut with the sword and sabre, without the least fear that any could start again. Not a single head remained. The fields stretched from a league and a half to two leagues from the fort. The destruction was complete." The fort and immense fields of corn thus described by Frontenac, give us a higher opinion of the power of these savages than we had been wont to entertain.

This sacrifice of house and food the Onondagas could submit to, though at great inconvenience and suffering; but they must, in accordance with their customs, give due notice to the enemy that vengeance would not be delayed.

A brave old warrior volunteered for this honorable duty. He was more than a hundred years old. For the period of three ordinary generations of men he had followed the war path. He was of man's estate when Champlain first invaded his country with fire arms and the sword, and ever since he had nursed his wrath,

* Doc. History, vol. 1, p. 212.

† Clark's Onondaga, vol. 1, p. 280.

‡ Mud and Bear Creeks, now both running in one artificial channel.

and glutted his vengeance, and now that he could no longer take on himself the toils and hardships of active war, he would show these pale faces how to die. Frontenac says, "he had no doubt prepared himself, during his long life, to die with firmness, however cruel the tortures he should have to endure. Not the slightest complaint escaped his lips. On the contrary, he exhorted those who tormented him to remember his death, and to display the same courage when those of his nation should take vengeance on them; and when a savage, weary of his harangues, gave him some cuts of a knife, "I thank thee," he cried, "but thou oughtest to complete my death by fire. Learn, French dogs and ye savages, their allies, that ye are dogs of dogs; remember what ye ought to do when ye will be in the same position that I am." It was, says Charlevoix, "a strange and curious spectacle, to see many hundred men surrounding a decrepit old warrior, striving in vain, by tortures, to draw a groan from him."

A detachment of the French visited the Oneidas and destroyed their crops, taking thirty prisoners, among them the principal chiefs, who vainly tried to make peace. The only terms the French would grant them, were removal to Canada and submission to the conqueror.

This barren victory of Frontenac resulted in great injury to the French, as by taking the Canadian militia from their fields in July and August, a famine ensued, that pinched quite as hard as the lack of provisions in Onondaga. As the French withdrew from the valley of the Oswego, the Indians hovered on their line, and cut off every straggling canoe, and in the whole affair the only man the Onondagas lost was the volunteer victim that remained in their burnt village. Thus ended this most formidable invasion.

Soon after, a party of the Five Nations was surprised by the French, several were killed, and one taken prisoner, who was publicly burned alive, and upon whom the Indians then trading at Montreal were invited to feast.*

The treaty of Ryswick, which made peace between the English and French, was signed September 10, 1697.

The governor of Canada, believing that the Five Nations thought that the general peace made them secure, resolved to take his last revenge, and he sent a party of Adirondacks to destroy a party of the Iroquois, who, in faith of the treaty, were hunting near Fort Cadaraqui. Several were killed on both sides. Soon after this, French commissioners appeared before the Onondaga castle. Peace was made to the great satisfaction of the French. "Nothing could be more terrible than this last war; the French ate their bread in continual fear. No man was sure, when out of his house, of ever returning to it again. All business and trade was often suspended, while fear, despair and misery blanched the countenances of the wretched inhabitants."†

The commissioners took with them to Montreal several of the Onondaga chiefs. They were received with every mark of respect, having awarded to them that consideration that brave men always command.

The prisoners that the Iroquois had taken were now free; some of them loved their new friends too well to leave them, and some who did return to Canada, came back and ended their days in Onondaga. The individual Frenchman and the Iroquois found little difficulty in harmonizing. The policy of the French rulers prevented this harmony and friendship from becoming national.

Thus ended the war commenced by Champlain's invasion in 1609; so far at least as it was carried on by the Five Nations in their sovereign capacity. The English had been their allies, and were fast becoming their masters, not by levying

* Clark's Onondaga, vol. 1, p. 283.

† Clark's Onondaga.

war, but, first, by assistance against common enemies, and then by negotiation and the arts of peace. From this time they recognized themselves as subjects of Great Britain, and were at war or peace as suited the policy of the governing nation.

In 1700, Robert Livingston, Secretary of Indian Affairs, visited Onondaga, and reported to the Earl of Belmont upon the proper policy for the English to adopt in regard to the Five Nations. He advised that Missionaries should be sent among them, and that forts should be constructed and garrisoned for their protection against the French. He proposed to locate one at the confluence of the Oneida and Seneca rivers.

The Indians represented to Col. Schuyler, Mr. Livingston and Mr. Hanse, that the "governor of Canada had charged them not to hearken to Corlear, for if they did so, he would take them off by poison." June 21, 1700. Dekanissora, at the head of an embassy, is in Albany, complaining that the French will not "take the hatchet from their hands" unless the Five Nations submit to them; and he said, "all of us here are resolved to have a protestant minister at Onondaga, the centre of the Five Nations, as soon as one can be sent to us." The governor promised the missionary, and that the Bible should be translated for their use, and proposed that they should send two or three of their sons to be educated at the expense of the king. The Indians replied that they loved the king, and were determined to continue firm to him and to his religion, saying that they had refused to receive the Jesuit priests; as to the offer to educate the boys, said the chief, "that is a subject not under our control; it belongs to the women entirely." They also asked that a smith might be sent among them. Forts were erected in their country, and the bonds of friendship were made strong.* Time rolls on, the bonds growing stronger with the years. On the 19th day of April, 1710, five of the principal chiefs who had been sent to England, were "conducted in splendid coaches to St. James palace, and the Lord Chamberlain, with much ceremony, introduced them into the royal presence;" and Queen Anne listened to a speech from one of their number. Thus she acquired their love, and when, in 1714, she died, her faithful subjects in the wilderness of New York sincerely lamented her.

The defence of the English fort at Oswego was entrusted to the Onondagas. When Sir William Johnson called for them they were ready, and assisted in winning the glory he acquired; and when the question of empire was decided between the great powers before Quebec, they were there. During the wars in which Washington won his first renown, these Five Nations of Indians kept the French from the northern frontier of Pennsylvania and Virginia, and forced them to make their attacks from the west. Situated, as were the Iroquois, on waters that run in four directions: east and west in Oneida, and north and south in Onondaga; animated, as they were, by an unconquerable love of adventure and conquest, they held the balance of power among the aboriginal tribes, and when two mighty nations of another race met on their territory, the party that secured their friendship, as might have been expected, triumphed.

Afterwards, when England found herself at war with her own colonies, these children of the forest did not desert her, but nearly all of them were most loyal and devoted. Mr. Clinton says, that in the war of the revolution, the Five Nations contributed to the aid of the British one thousand five hundred and eighty men. "They hung like the scythe of death upon the rear of our settlements, and their deeds are inscribed, with the scalping knife and tomahawk, in characters of blood, on the fields of Wyoming and Cherry Valley, and on the banks of the Mohawk."

* Clark's Onondaga, vol. 1, p. 291.

The chastisement that we inflicted on the Five Nations was terrible as their own cruelties had invoked. On the 21st of April, 1779, Colonel Van Schaick surprised the Onondagas, and destroyed their village, provisions and munitions of war, killing twelve and taking thirty-four prisoners. The destruction of their property was complete. The same year the campaigns of Sullivan carried war and famine to the Senecas and Cayugas, effectually breaking the power of the Iroquois.* The Mohawks fled to Canada with Sir John Johnson.

The treaty of peace with England gave us the chain of the great lakes as our northern boundary; no stipulation whatever was made in regard to these tribes, they consequently found themselves in the condition of a conquered people, entirely at the mercy of enemies, who had become highly exasperated by their dreadful cruelties. The Legislature of New York evinced a disposition to expel them from all their territory; but the humane counsels of Generals Washington and Schuyler saved them from total ruin.* The treaty made at Fort Stanwix, in 1784, by commissioners of the government, and the Indians secured sufficient reservations of land to all the Iroquois, except the Mohawks, who had gone to Canada. But this treaty appeared hard to the Indians, who had gone into the war at the command of a government that they felt bound to obey, and that had so shamefully neglected them in the final settlement. Some of them joined the western Indians, and took part in the wars that followed the revolution;—but after the defeat they suffered at the hands of Wayne's army, they returned to their homes in "submission and humiliation."

A generation passed away, and again the people of the United States were at war with England. The old chiefs had mostly died, and the young men had grown up with feelings of attachment to their immediate neighbors, who experience had taught them were friends. The English, according to their custom, had employed such Indians as could be induced to fight for them, and our Niagara frontier became the scene of contests in which the scalping knife played its part. General Peter B. Porter called on the remnants of this people for a force that might be opposed with success to the Canada Indians. A council was held, to which all the tribes were invited, and all but the Mohawks came. It was resolved to aid the United States with all their force. By ancient usage the Mohawks were to furnish the commander-in-chief, but they having left the confederacy, it was necessary to depart from the usage, and elect one in general council. Debates ran high, until the celebrated SAGOYAWATHA (Red Jacket) settled the matter, by proposing HON-A-HOA-QUA (La Fort), an Onondaga chieftain. He accepted the post, and died at Chippewa, having received his death wound while bravely leading his people. His dying words were expressive of his gratification at having been placed at the head of his nation, and having done his duty there. The braves of the Onondagas gathered around the prostrate hero, and exclaimed in their own language, "Alas, great chief! the brave! the brave!"†

Thus has been traced the history of this extraordinary people; once as truthful, as brave, as proud a race as ever lived, now reduced to a mere remnant, acquiring the vices of other men, to be added to their own. A few brood over the traditions of a greatness forever gone, while most of them have become farmers, and aided by a school and missionary effort, are gradually adapting themselves to the habits of the whites. In the Onondaga Valley they have a tract of land large enough to abundantly supply all their wants, and whenever they shall cultivate it themselves, instead of leasing to others, they will become rich.

* Clark's Onondaga.

† Webster received his dying words while acting as aid to Gen. Brown, to carry orders to the Indians, he understood the language.

The statistics of their agriculture will appear with those of the towns of the county.

ANTIQUITIES.

The whole space allowed for this paper would not be sufficient for a full investigation and discussion of all the objects of interest connected with the past occupancy of this county. A very brief account only can be attempted. As long ago as 1810 or '11, De Witt Clinton visited the town of Pompey, and gave an account of antiquarian remains. Mr. Clark, in his history of Onondaga county, and Mr. Schoolcraft, in his report, have each given a much more extended notice of the various forts and other objects of interest, accompanied with drawings, than would be admissible here. To these works, therefore, those persons whose curiosity demands more than will be found in this report are referred.

Three different nations supplied early visitors to this section of country, the Spanish, French and Dutch, and each of them have left behind them some traces of their visits. We have no knowledge of any European having visited this country previous to the invasion of Champlain in 1610; but Mexico was conquered nearly a hundred years before, and the Spanish thirst for the precious metals may have led parties as far into the interior as Onondaga. The Portuguese had explored nearly the whole of the coast of North America in 1501, and the French fished on the banks of Newfoundland as early as 1505.* Some parties may have visited this region early in the sixteenth century. However this may be, there was picked up in Pompey, about the year 1820, a stone, that may now be found in Albany, where it was placed under the care of the late Doctor T. Romeyn Beck, that appeared to have been used as a grave stone, to mark the place of interment of some European. On its centre is engraved rudely the figure of a tree, with a serpent coiled around it, with the words and figures *Leo De Lon, VI., 1520*. This is the only relic that has been found that may not be easily accounted for, as having been connected with some of the traders and missionaries that visited the Onondagas after Champlain's invasion.

The Dutch cultivated trade with the Indians, and at an early day made long journeys into their territories to exchange merchandize for furs. They carried fire arms to use and to sell, and their safety demanded the erection of such forts or strong places as we see have once existed here. The French, too, during the truces in the war with the Indians, strove with great energy to secure a foothold among them. The metallic implements, guns, swords, hatchets, locks, bells, horse shoes, hammers, beads, medals, crucifixes, brass kettles, pewter plates, blacksmith's tools, and other like relics that have from time to time been dug up, were in all probability brought here by traders and missionaries. The circular and elliptical works found here have already been ascribed to wars that once were waged between the different tribes. There is nothing of all the curious antiquities found here, except the stone having the date 1520, that leads us to suppose that this country had been at any time visited by Europeans before 1610; but we may very readily believe that we have but a meagre history of the various parties that for one purpose or another came here after that date, and before the regular settlement by the present occupants.

* Clark's Onondaga, vol. 2, p. 266.

CHAPTER I.

TOPOGRAPHICAL SKETCH OF ONONDAGA COUNTY.

The county of Onondaga is nearly in the geographical center of the State. The Court House, in the city of Syracuse, is in latitude forty-three degrees three minutes north, and longitude seventy-six degrees fourteen minutes and four seconds west from Greenwich, or no degrees forty-eight minutes eleven seconds, east from the observatory in Washington, as nearly as can be determined without too much inconvenience, and near enough for any purpose of this report. The city of Syracuse is very nearly in the center of the county, which is bounded on the north, by Oswego county; on the east, by Madison; on the south, by Cortland; and on the west, by Cayuga.

The general form of the county is a rectangular parallelogram, having its lines east and west, and north and south; the north-east corner being somewhat rounded off by Oneida lake, and the south-west by Skaneateles lake. From north to south the average width is thirty miles; and from east to west twenty-six. The area of the county, exclusive of lakes, is in acres, 459,229, of which there were, in 1855, of improved land, 344,528, and of unimproved 114,701.

The county is now divided into the towns of Lysander, Clay, Cicero, Elbridge, Van Buren, Salina, DeWitt, Manlius, Camillus, Geddes, Skaneateles, Marcellus, Onondaga, Pompey, Spafford, Otisco, La Fayette, Tully, and Fabius, and the city of Syracuse.

Most of the surface of this county slopes to the north, and is drained into the river St. Lawrence, but the summit of the highlands that divide the waters that flow north from those that run south, and find their way by the Susquehanna river to the sea, is within this county, though near the south bounds; but a small part of the whole area being drained to the south, and that chiefly in the towns of Fabius and Tully.

About two-fifths of the whole surface of the county is flat and barely rolling enough to permit drainage. This flat land constitutes a part of what is known as the "great level," which extends along the south side of Oneida lake, to the base of the slope of the spurs of the Allegany mountains. The Erie canal runs along the south side of this level land. That part of the county lying south of the canal, constituting about three-fifths of the whole, is embraced within the northernmost spurs of the mountain ranges, and partakes of the characteristics that belong to such countries; being uneven and comparatively broken in its surface. A traveler crossing Onondaga county from east to west, or from west to east, if his route is on the plain north of the highlands, will meet only slight hills and hollows, or rather mere undulations crossing his course, and streams that have their surfaces nearly level with the surrounding land. But if his

route is across the line of the hill slope, he will descend into deep valleys, whose dividing ridges are many miles apart, and he will have one constant succession of toilsome descents and ascents, enlivened and rendered pleasant, by ever-recurring points of observation, from which the most splendid scenery lies pictured before him. Hill side, mountain top, wide valleys, lakes framed with forests and fields of living green, meet his gaze from the top of every eminence he passes. If he sees little of the grandeur of rock-ribbed mountains, he is delighted with landscapes, more mild, and of a softer tone, and that bespeak more fitting residences for men, and he is delighted with the reflection, that of all he sees, there is nought but that combines the useful with the beautiful.

The slope of the highlands is divided into five distinct ridges, all having a general north and south direction. The most eastern of them enters the town of Manlius, from the east, and extends north to the Erie canal. The second ridge lies between Limestone and Butternut creeks, and makes the highlands of Pompey; a part of those of Manlius, Lafayette and DeWitt. The third range, between Butternut and Onondaga creeks, comprises the highlands of the central part of Lafayette, the west part of DeWitt, and the east portions of Tully and Onondaga, and extends to the city of Syracuse. The fourth range, between Onondaga and nine mile creeks, comprises the highlands of Otisco, the west part of Tully, Lafayette and Onondaga, and the east parts of Marcellus and Camillus. The fifth range lying between Nine mile and Skaneateles creeks, and Otisco and Skaneateles lakes, comprises the highlands of Spafford, the west parts of Marcellus and Camillus, and the east parts of Skaneateles and Elbridge. The summits of the valleys, between these ranges, are in the towns of Pompey, Fabius and Tully, or south of the county line. The highest peaks of the ranges of hills are in Spafford, Pompey, Otisco and Lafayette. The streams that drain these valleys to the south, are the head branches of the Tioughnioga river, one of the tributaries of the Susquehanna. Limestone and Butternut creeks unite their waters, and then flow into the Chittenango, a few miles before that stream enters Oneida lake. Onondaga and Nine mile creeks run into Onondaga lake. The Skaneateles crosses into Cayuga county, just before it discharges its waters into the Seneca river. Seneca river enters the west part of the county from Cross lake, flowing between the towns of Elbridge and Lysander, and along the north bounds of Van Buren and Geddes, to within less than half a mile of Onondaga lake, where it receives the outlet of that body of water, then turning north, it runs along the west line of Clay, to Three River Point, where it receives the Oneida river. At this place the combined waters take the name of Oswego river, which empties into lake Ontario, in the city of Oswego.

These various streams and bodies of water, with their tributaries, are so evenly distributed over the surface, that the whole county is wonderfully well supplied with water for use, and power to drive machinery. Seneca river has a dam giving a fall at Baldwinsville, of seven feet, and another

at Phoenix, either of which would give sufficient power for a large manufacturing town. The several streams that flow through the valleys of the south part of the county, fall, on an average, not less than eight hundred feet; after they are of sufficient size to be useful in driving machinery, and at the north-east corner of the county, the united waters of the Butternut, Limestone and Chittenango make the valuable water power of Bridgeport. Many beautiful water falls are formed by the branches of the principal streams, as they flow down the sides of the ranges of hills to the vallies. The most noted of the cascades, is known as Pratt's Falls. Such is a general outline of the county of Onondaga. When it was first seen by the races of men who now cultivate its soil, and direct its vast industrial pursuits, it was covered with one dense forest of trees of giant growth, excepting the few fields that the natives had subjected to their rude cultivation.

SETTLEMENT BY THE WHITES.

The first white man who made a permanent residence in Onondaga county, was Ephraim Webster. He had been a soldier in the Revolution, serving until the close of the war. It is supposed that, in his campaigns, he had become somewhat acquainted, and friendly, with that portion of the Oneidas that took our side in the contest. Webster first settled at Oriskany, in the character of a trader, and there learned the Indian language. From Oriskany, he made several excursions to Onondaga, became intimate with his new friends, and finally accepted their invitation to go among them to live. In 1786, accompanied by another trader of the name of Nukerk, he opened his store on the east bank of Onondaga creek, near its mouth, and there exposed, for sale, the little stock he had brought, by water, from Schenectady. Nukerk died the first summer; and in the fall Webster went to New York with his pack of furs, returning the next spring with more goods, and from this time became a permanent inhabitant of Onondaga. In the spring of 1787, two traders, Campbell and Maibee, followed Webster, and took up their residence at Onondaga Hollow.

Ephraim Webster was a man of adventure, and was possessed of a courage that never faltered. He found the Indians smarting under the defeats of the war, nearly stripped of their lands, subjugated, and dependent upon their conquerors for supplies that civilized men alone could furnish them. They had invited Webster to live with them, as a trader, and they had, unquestionably, as much confidence in him as they could have in any one of their masters, and yet his life was in hourly peril. Circumstances, that would appear trivial to us, in the minds of untutored savages, were proof strong as Holy Writ, that he was plotting their injury. Again their confidence would be restored, by circumstances quite as trivial as those which first excited their unjust suspicions.

An instance, illustrative of this, is related by Clark, as follows: "For some real or fancied wrong, he was judged worthy of death. He gave up all for lost, and fully made up his mind that his time had come. His

grave was dug, and he was told to prepare for immediate death. A large ring was formed around him; his executioners, four in number, were appointed, and their positions taken; four glittering tomahawks gleamed in the sunlight. A sturdy brave firmly held each of his hands, stretching his arms to their utmost extent. It was asked of him (as is the custom) if he had any request to make before he expired. He said, he only desired a cooling draught of water. 'None, none, none,' was the reply; he appealed to them in affecting tones, not to deny a friend this simple request. The venerable war chief, Ondi-ya-ka, stood forth, while the ready weapons were poised over his head. 'Hold!' said he, 'stay your hands, offend not the Great Spirit; let him drink one cup of water for the last time!' The cup was presented, while one hand was released by the Indian who held it. Webster took the cup, gracefully bowed his head, and most cordially drank the health of the chiefs, braves and warriors of the Onondaga nation. This maneuver was so unexpected, so appropriate, and done with so much grace and aboriginal naïveté, so respectfully, and with so much coolness and gravity of demeanor, that with one voice they shouted, 'he is free! let him go, he is one of us!' He was free, and henceforth safe among them. He was too brave a man to be a traitor; and having once fully gained the Indians' confidence, by conduct like this, nothing could shake it."

Webster married an Indian woman; and from him, though by right of the female side, has descended the present A-to-tar-ho, or principal civil officer of the confederacy. After the death of his Indian wife, Webster married a white woman, and raised a considerable family, who inherited the lands given by the Indians to their father.

Some years since, an interesting suit was tried in this county, brought by the half-Indian son, for these lands; but he was beaten.

Webster was employed by our government from 1788 to 1794 in gaining information as to the conduct and purposes of the Western Indians, and gave full satisfaction to his employers. A mile square of land was given to him by the Indians, and the grant confirmed by the government. Webster received the parting words of Hoh-a-hoa-quā, on the bloody field of Chippewa, and lived to the age of seventy-two, retaining the confidence both of the Indians and whites, having filled the offices of supervisor and justice of the peace of the town of Onondaga.

The business of Webster in Onondaga was traffic, and though he was the first of our people who settled here, he was not the pioneer of the men who came to develop the resources of the soil; this honor is due to Asa Danforth and Comfort Tyler.

With the spring of 1788, the settlement, by the present race of men, in Onondaga commences.

Danforth had been invited to Onondaga by Webster, who had received his hospitalities while hunting in Montgomery county, where Danforth then lived. Webster used his influence with the Indians to get their consent to Danforth's coming among them. This being obtained, early in May,

1788, Asa Danforth embarked with his family, household goods and tools, in two flat bottomed boats, from Montgomery county. Passing up the Mohawk, they made the Portage at Rome; and thence through Oneida lake and river, around by Seneca river, and Onondaga lake, landing at the mouth of Onondaga creek, where they met Webster, Comfort Tyler, and Mr. D.'s son Asa, who had been sent across the country with the stock, had arrived in advance of the boats. Passing up the creek, the first settlement was made a little south of Onondaga Hollow, May 22, 1788.

The Indians treated the family kindly, except when under the influence of intoxicating drinks, furnished them by two base men, who had found their way into the valley with that worst enemy of the Indians. The better part of the tribe called for aid from Danforth and Tyler to put an end to this traffic. The traders refused to desist, and offered a barrel of rum, and to every Indian a new knife and tomahawk, if they would drive Danforth and Tyler away; the chiefs, however, gave them their protection, and the base offer was rejected.

In December, Major Danforth, visited with his wife, her old home in Massachusetts, and returned about the middle of March, 1789, the savages cordially welcoming them back.

The spring was propitious, potatoes were brought from Whitestown for seed. Their own crops were put in, and the Indians prepared their lands; sowed and planted after the manner of the whites. Tyler and young Danforth went to Massachusetts, and when they returned, Mrs. Danforth had the pleasure of greeting a daughter-in-law, and Tyler had a wife to introduce. These were the first white women Mrs. D. had ever seen in Onondaga. John Brown and family came with the two brides, and now it began to be felt that there was a goodly company to begin the contest with the forest.

On the 14th of October, 1789, was born Amanda Danforth the first white child in Onondaga. She became the wife of the late Col. Phillips, and mother of Mrs. Peter Outwater. These were the pioneers in Agriculture, teaching the Indians, and laying the foundation of prosperity for us, themselves enduring hardships innumerable; their lives constantly in danger; often in want of wholesome food; and without medical attendance. These privations and trials bore especially hard on the women, but they bravely encountered them all. The nearest mill was seventy-five miles off, at Herkimer. Corn was pounded in a hollow made in the top of a white oak stump. A half bushel at a time was put in, and the pestle, which was worked by a spring pole, cracked it into a condition fine enough to be used for food. Wheat could not be made fine enough in this "mill" for bread, though it could be used for puddings and the like, after the coarser particles had been many times sifted out. In sickness, Herkimer flour was sparingly used, but soon a small hand mill was procured that would grind wheat.

In 1792, Major Danforth erected the first saw mill in the county, on land he had previously bought, in the present town of De Witt; the Major

himself bringing the saw on his shoulder from Utica, and the Indians the nails. The following year he built a grist mill by the side of his saw mill, one mile north of Jamesville, on the present site of Dunlop's Mills.

There were no roads over which the bolts, stones, &c., could be brought, but all difficulties were overcome. A week was consumed in raising the building, men coming from as far as Utica, and living in bark cabins. They mustered sixty-four, including Indians. Abel Myrick was the master builder.

Asa Danforth was called by the white men "The father of the county;" by the Indians, *Hat-e-col-hot-was*, the man who plows the ground. Honorable titles both. He was born at Worcester, Mass., July 6th, 1746, served at the battle of Lexington as captain, and through the war as major. In Onondaga he rose to the rank of major-general, and was called upon to fill most of the important civil offices of the county,—among them, judge of the county court, and Superintendent of the salt springs,—he was also State Senator for the western district. He spent more than thirty years of his life here, and died, universally lamented, in 1818.

Comfort Tyler, who came with the Danforths, also performed an important part in our early history. He, too, was a soldier of the Revolution. He was born in the town of Ashford, Connecticut, Feb. 22d, 1764. Soon after Danforth and Tyler's settlement at Onondaga Hollow, other families came and settled near them,—among them the Pattersons, Ten Broecks, Longstreets, Needhams, and others,—and the progress of the settlement was rapid. In 1794, the first post office was established at Onondaga Hollow, Comfort Tyler being made postmaster: In the same year the county of Onondaga was erected, including within its boundaries all the counties of Seneca, Cayuga, Cortland, and part of Tompkins and Oswego, besides its present territory. In 1796, the tract of land known as the Onondaga Reservation was surveyed and divided into two hundred and fifty acre lots. The first town meeting was held at Asa Danforth's house in 1798, he presiding, Ephraim Webster being chosen supervisor.

A description of the settlement of the town of Onondaga has been given, because it was the first made in the county. For a brief account of the other towns, which would occupy too much space if given here, French's Gazetteer, for 1860, may be consulted; and for a fuller narrative of the interesting events which transpired at those early periods, the reader is referred to Clark's Onondaga. A few words in reference to the founding of the city of Syracuse, and its present condition, will close the little we have to say of the early settlement.

CITY OF SYRACUSE.—In 1804, a law was passed directing the sale of two hundred and fifty acres of the land of the Salt Springs Reservation, and that the avails should be laid out under the authority of James Geddes, Moses Carpenter, and John Young, in constructing a road from the town of Manlius west across the Reservation. The land was located and surveyed by Mr. Geddes, and was duly sold at auction for the sum of \$6,550,

in the month of June of that year, to Mr. Abraham Walton, thus acquiring the name of the "Walton tract." This two hundred and fifty acres is in the central part of the present city of Syracuse.

Mr. Walton laid out his purchase into village lots, and commenced their sale. In 1805 he erected mills. In 1814, so much of the tract as remained unsold was transferred to Forman, Wilson & Co., for about \$9,000. From these proprietors, in 1818, it passed into the hands of Daniel Kellogg and William H. Sabin. In 1823 they sold to Henry Eckford, and in May, 1824, the property passed into the hands of the Syracuse company, for the sum of \$30,000. From this time the growth of the village was rapid. In 1847, it was incorporated as a city. It has eight wards, and by the census of 1855, had 25,107 inhabitants. The manufactory of about 7,000,000 of bushels of salt within, and in the immediate vicinity of the city every year, gives employment to a large number of men, and insures a constant and healthy growth.

The site of this city is one of great beauty. It is a level plain, at the foot of the slope of the highlands of the south part of the county, with the lake nearly enveloped with salt works on the other side. The city, though standing on level ground, is susceptible of perfect drainage into the Onondaga creek, which runs from south to north nearly through its centre, on a level about thirty feet below the general level of the plain. The hills that form the back ground, have many points of great beauty for suburban residences, and are fast being occupied by costly structures.

The surface soil on which the city stands, is tenacious, and being level, it was formerly covered with a "dark, gloomy and almost impenetrable swamp." The whole is underlaid with coarse, open gravel, through which water runs freely, and cellars that reach into this gravel are dry. The gravel dips to the south; on the north side of the Erie canal, it is found near the surface, while on the south, deeper excavations are necessary to reach it.

This city is crossed from east to west by the Erie canal, and the Oswego canal unites with the Erie near the center of the city. The New York Central railroad runs through the center, crossing from east to west. In the city this road branches, and has two lines running west, one by the way of Auburn, Cayuga and Seneca lakes, Geneva and Canandaigua. The other by way of Clyde and Lyons. The Oswego and Syracuse railroad makes a connection with Lake Ontario, and the Binghamton railroad with the New York and Erie and Pennsylvania railroads. These various avenues of trade and travel bring Syracuse into free communication with the whole country, and have caused it to be called "The Central City." The means of communication now possessed by this city, and the county are in strong contrast to those enjoyed by the earliest settlers. The rivers that unite their waters at Three River Point, were used by them to transport most of their supplies. The first salt works in the town of Geddes, received their kettles from Pennsylvania, by way of the Susquehanna river and its branches, the Chemung and Conhocton, then over a portage to a tributary of Crooked lake;

thence down the lake and its outlet to Seneca lake; thence by Seneca river to the outlet of Onondaga lake. By way of the Oneida river and lake, by making a portage where Rome now stands, there was a connection made with the Mohawk river. In due time, roads were made that crossed from east to west, and from north to south. Until the completion of the Erie canal, in 1825, our goods were transported by the merchants at great expense from Albany, in wagons drawn by from three to seven horses, making slow and toilsome progress. These big wagons carried back the potash in barrels that the merchants had taken in exchange for their goods. In the winter, our farmers drew wheat to Utica, where the merchants purchased it, and sent it down the Mohawk in small river boats in the spring; or the farmer continued on to Albany, and sold his wheat, and perhaps returned with a load of goods for some neighboring merchant. Thus we were forced to transport our surplus farm products, one hundred and fifty miles by land carriage over the bad roads of a new country, or over the much better surface, made by the snows of winter. The price here of wheat during this period was about fifty, sixty-three, or perhaps seventy-five cents a bushel, except during the war of 1812 to 1815, when prices were much enhanced. Our great and reliable markets have always been the cities on tide water.

CHAPTER II.

GEOLOGY.

Onondaga presents more features of interest to the geologist, than any other county of this State, or, perhaps, any like extent of country in the United States. Its rocks range east and west; the order of succession being constant; the lowest being at the northeast corner of the county, and the highest, and most recent, at the southwest.

Of the New York system of rocks, there outcrops in this county, the

Clinton Group,
Niagara Limestone,
Onondaga Salt Group.
Water Lime Group,
Oriskany Sandstone,
Onondaga Limestone,
Corniferous Limestone,
Seneca Limestone,
Marcellus Shales,
Hamilton Group,
Tully Limestone,
Genesee Slate, and the lower measures of the
Ithaca Group.

These rocks are best observed by commencing at the northeast corner of the county, and moving to the southwest, crossing their outcrop nearly at right angles, and in the line of the greatest dip of the stratification. The

starting point will be Oneida lake, where the Clinton Group outcrops; the end of the journey, Skaneateles lake. The elevation of the starting point, above tide, is 369 feet; the highest point passed over, Ripley Hill, the summit between Skaneateles and Otisco lakes, and the highest land in the county, being 1,982½ above tide. The distance, in a direct line, from Oneida Lake to Ripley Hill, is thirty-two miles.

The dip of the system of rocks, in this direction, is, very exactly, twenty-six feet to the mile, giving, for the distance, 852 feet. It is very uniform, and is greatest in a line a little west of southwest; while the general line of the outcrop is nearly east and west. These rocks were deposited in that vast sea that once overspread this part of the continent, all of them being sedimentary, and filled with evidences of an abundant animal life. When they were lifted above the sea by those vast internal forces that are constantly changing the form of the crust of the earth, they were tilted from the level position in which they had been deposited. The point of greatest upheaval being far to the northeast of this county; only part of one of the slopes comes under our observation.

The hills rise in a direction opposite to that of the dip of the rocks. The surface rising, in the thirty-two miles, over sixteen hundred feet; the bottom of our lowest rock falling, in the same distance, more than eight hundred and fifty-two feet; a section of these formations would show a wedge, 2,465 feet thick at the southwest end, regular on the lower side, but on the upper, broken by unequal steps, due to the varying thickness of the different strata. The surface waters run northerly; while those underneath flow in the opposite direction. Springs are not to be looked for along the unbroken line of the outcrop of the rocks, but in the sides of the various valleys that cut this slope, at or near right angles, or on the north sides of such valleys as are parallel with the line of the outcrop.

Any attempt to procure water by artesian wells would, probably, prove unsuccessful, unless deep enough to reach the granite formations.

The rocks that outcrop in this county once extended over the present surface far to the north, but by the action of water, they have been broken down, ground up, and strewn along the valleys that have been scored out across the line of their present outcrop, and those with which they connect, far beyond the southern limits of the county and State.

This point will be more fully investigated hereafter, a description of the rocks being first necessary.

The northernmost and lowest rock is known as the Clinton group. It is seen in the counties east and west of this, underlies the whole north line of this county, and appears on both sides of the west end of Oneida lake. "This group is characterized by its iron ore beds and its marine plants,"* The iron appears in this county only in small quantities, the rock being covered with alluvium except at a few points. The best place to observe it is near the west end of Oneida lake, at Fort Brewerton. There the shale appears along the bank of the outlet, and in the hill in the village.

The north part of the towns of Lysander, Clay and Cicero lies on this rock, and the soils of these towns are, to some extent, made up of the materials of which it is composed. Prof. Emmons says of it that its most interesting feature "consists in the rapid changes in the strata, which enter into its formation, and which, taken together, form a most heterogenous assemblage of materials; for this reason the group was called in an early stage of the survey, the *Protean group*. The formation consists of layers and beds composed of green, blue and brown, sandy and argillaceous shales; alternating with greenish brown sandstones, conglomerates or pebbly beds; and oolitic iron ore. These different kinds of materials rapidly succeed each other. The parts of this formation which are the most persistent, are the green shales; whose color, however, inclines more to blue than green, where they have not been exposed to weathering. The sandstone, which is rather harsh, in consequence of the preponderance of sharp, angular grains, is also greenish, or greenish gray,"* It rests on the Medina sandstone, which in turn rests on the gray sandstone of Oswego, "which," according to Emmons, "is identical with the gray, thick-bedded sandstone of the Hudson river series," These rocks furnish the materials for much of the drift that covers the north part of this county.

The Clinton group is found in Ohio, Pennsylvania and Canada. In this State, according to Mr. Hall, it is not more than eighty feet thick.

Resting on the Clinton group, and next in order, we find the *Niagara Limestone*, so called from its being the rock which forms the famous cataract of that name. In Onondaga this is a thin rock, thinner at the east side than at the west. It crosses the east line of the county at Bridgeport, forming a bar across Chittenango creek, and thus creating a valuable mill power. It outcrops at various places in the town of Cicero, and on Mr. Whiting's farm, where it is extensively quarried for the valuable building stone it affords, it presents a surface of fifteen acres, but thinly covered with soil. It has been used to a limited extent for burning into lime.

The layers are respectively fourteen, seven, three and four inches thick. Below these the courses are thin and of no value. The whole thickness at Whiting's is three feet. The seams are frequent, making the quarry easy to work.

This stone has been quarried at several other points along its outcrop to the west line of the county. The most important openings are north of Baldwinsville, and near the northwest corner of the town of Lysander. This rock contains "some geodes, lined with rhombic crystals of carbonate of lime, and gypsum, in small globular accretions, at Whiting's quarry."† "It differs so much in its appearance here from the western geodiferous limestone, that it would hardly be recognized as the same rock, if it could not be traced almost uninterruptedly in its western route, but it marks the termination of the Ontario division, of the State reports, and is the upper measure of a distinct era in geological history, whose importance cannot be well estimated."‡

* Emmons.

† Vanuxem.

‡ Emmons.

THE ONONDAGA SALT GROUP rests on the Niagara limestone. The lower part of this formation is the Red Shale, upon which, and in some cases, mingling with it, is placed the Green Shale, the two constituting the whole group.

Embraced within the Green Shale are the Gypsum beds, and the vermicular, or porous lime rock. This group is very extensive, reaching from near the Hudson river, quite across the State. All the Gypsum masses of Western New York are found in it, and from it flows all the salt water used for making salt in Onondaga and Cayuga counties.

The Erie canal runs near the line of division between the Red and Green Shales, for the whole width of the county. The level-district north of the canal, and south of the Niagara outcrop, is nearly all based on the Red Shale, while the slope reaching from the canal to the Water Lime range, on the south, is principally made up of the Green Shales. The average width of the Red Shale is about seven miles; that of the Green, about three.

The Red Shale, as computed from the dip and elevation, is three hundred and forty-one feet thick, at the line of the Erie canal, south of Onondaga lake. The surface of that lake being, very exactly, three hundred feet above the Niagara Limestone. It is generally covered with drift, composed of lime, gravel, sand, and small stones, made up mostly of the Medina sandstones, and the gray sandstones of Oswego county, with occasional beds of clay.

Owing to whirls and eddies in those surges, that beat down and ground up these rocks, numerous conical shaped hills generally, somewhat longer from north to south than from east to west, and differing in size, from a few acres to several hundred, have been dotted over the surface of the western part of this formation, like hay cocks in a meadow. The largest one is at the mouth of the valley of Nine Mile Creek. The Erie canal passes around it on the south, and the Central railroad on the north. It is two hundred feet in height, containing about a thousand of acres of drift, and so level is the plain on which it stands, that a canal without a lock might surround it. These drift hills also abound in the district embraced by the Green Shales, but the transported stones that cover them have a greater proportion of granite boulders of large size.

The Red Shale is described by Prof. EMMONS, as properly, a *red marl*, soft throughout, except a few thin strata of sandstone near the top, but even these fall to pieces and cannot be employed at all for purposes of construction. Whenever it crops out, it is covered with its own debris. He determined that one hundred grains of the most sandy part, and the same amount of the softer kinds were combined in the following proportions:

	Sandy.	Marly.
Silix,	68.25	68.86
Peroxide of iron and alumina,	6.25	14.98
Magnesia,	5.75	0.40
Carbonate of lime,	10.25	9.89

	Sandy.	Marly.
Phosphate of alumina, and phosphate of peroxide of iron,	00.00	0.14
Organic matter,.....	6.00	4.50
Water,	1.00	6.48
	<hr/> 99.50	<hr/> 99.25

In some places this Red Shale is so soft that it is extensively manufactured into brick; in others, the sand is in layers, having thin strata of clay between them. "Nowhere has a fossil been discovered in it, or a pebble, or anything extraneous, except a few thin layers of sandstone and its different colored shales and slate."*

GYPSEOUS OR GREEN SHALES, CONTAINING THE BEDS OF GYPSUM.—Immediately on, and united with the Red Shales, we find the plaster bearing Green Shales. The line of division is not well determined,—the red, green, and yellow colored, with some of a blue cast, intermingle for a few feet in thickness. The color of this upper measure of the salt group is variable through its whole thickness, being sometimes nearly white, then drab, but it has received its name from the prevailing green. A better name would be the *Gypseous Shales*, as the term Green Shales is sometimes applied to portions of the Clinton Group. In this Gypseous Shale large masses are found that Prof. Eaton called *vermicular lime rock*. "This rock is essentially calcareous, strongly resembling porous or cellular lava. In color it is a dark gray or blue rock, perforated everywhere with curvilinear holes, but very compact between the holes. These holes vary from microscopic, to half an inch in diameter; they are generally very irregular, and communicate in most instances with each other.

The resemblance of no small part of the rock to a porous lava is perfect; but the structure of the cells leaves no doubt as to their mineral origin. The cells show that parts of the rock were disposed to separate into thin layers which project into cells, evidently the result of the simultaneous forming of the rock, and of a soluble mineral, whose removal caused the cells in question. This view is confirmed by the discovery in this rock of those forms which are due to common salt, showing that a soluble saline mineral had existed in it, had acquired shape in the rock, and had subsequently been dissolved, leaving a cavity or cavities."* There are two masses of this *vermicular rock*—one low down, of about twenty feet in thickness, appearing on James street, Syracuse, and at various other places; the upper mass is thinner, but its thickness is not uniform. In the lower mass, on James street, are some specimens of crystalline character, being serpentines, the action of crystallization having been very powerful but local, producing mica, and even nodules of granite, or rather syenite.

Between the two layers of *vermicular lime* are the hopper-formed masses. Perhaps these hopper-formed rocks possess more interest for the geologist than any other part of the group, because they are supposed to

furnish proof of the origin of the salt water, of so much importance to the industry of this part of the State.

These forms are produced, it is asserted, by the crystallization of salt before the hardening of the clay. The supposition being that, while the whole mass was in the form of mud, having a large quantity of dissolved salt mixed with it, the salt, in precisely the manner we can see in the process of the manufacture of solar salt, attracted particle to particle and assumed the form of a hopper, the mud filling it up; then, by the action of water falling on the surface and percolating through the mass that had become full of cracks in the process of drying, the salt was dissolved and carried down upon the more compact strata below, and by the dip of that strata carried into, rather than out of the hill. No other common soluble mineral presenting similar forms, and the fact that all our salt water is found below, and near these hopper-formed rocks, gives great force to this theory. The absence of salt around these hopper-formed rocks is accounted for, by their being so near the surface that the rains must have long ago carried it away. If an excavation were made farther south, where the overlying rocks are thick enough to protect the salt-bearing rocks from the action of water, undissolved salt might be found.

Besides the minerals described as being in, and belonging to this Shale, we have yet to mention the beds of gypsum. This valuable mineral is found in various places, in the upper parts of the salt group, through the whole county. It is extensively quarried in Manlius, De Witt, Onondaga, Camillus and Elbridge. The largest openings are in De Witt, northeast from Jamesville. It is here found in masses more than thirty feet thick, of an excellent quality, and is sold on the bank of the canal sometimes at less than one dollar per ton.

Some very valuable quarries are worked in the town of Camillus. The railroad cutting, along the valley of Nine Mile creek, exposes large masses. The whole thickness of the gypseous shale, is 295 feet. Prof. Emmons gives the composition of the hopper-formed masses, as follows:

Water of absorption, .....	.56
Organic matter,	5.00
Silex,	34.56
Carbonate of lime,	43.06
Alumina and protoxide of iron,	13.36
Sulphate of lime,	1.00
Magnesia,	2.17
	<hr/>
	99.71
	<hr/>

One hundred grains in six ounces of rain water, yield of the debris of the shale, 6.53; of which 1.03 is vegetable matter, and 5.50 saline.

Prof. Emmons gives an analysis of the water of Mr. Geddes' well at Fairmount, which receives its water through a seam in the *Vermicular limerock*. It is as follows:

One quart evaporated slowly to dryness, the last part of the process being performed in a platinum capsule, gave

Solid matter,	8.72
Organic matter,	1.44
Saline,	7.25

"The water of the hydrant company, which supplies Syracuse, contains forty grains of saline matter to the gallon. It consists of the chlorides of sodium and calcium, sulphates of lime and alumina, with some organic matter." * The springs that are discharged from these rocks deposit Tufa. Only a few fossils are found in the upper part of the Gypseous Shales. Prof. Hall assigns the rocks composing the Salt Group, to a mud volcano, that was "charged with saline matter and corroding acids, which would alone destroy all organisms." Vanuxem says, that "The Salt Group, as a whole, presents the same order of saline deposits, including iron, observed in the salt pans where solar evaporation is used. The first deposit in the pans is ferruginous, being red oxide of iron, and staining, of a red color, whatever it falls upon; the next deposit which takes place is the gypsum; the third is the common salt, the magnesian salt remaining in solution. The group shows first a thick mass, colored red with iron, being its *red shale*; above which are the gypseous masses; towards the upper part of which are the salt cavities; the sulphate of magnesia exists above the whole of these deposits, its existence there being manifested by the needle-form cavities."

WATER LIME, is the name given to the next group of rocks. It rests on the Gypseous Shales, and is, in all, 127 feet thick. The lower measures are irregular in their formation, having uneven beds, with layers of varying thickness. This part of the rock is used mostly for farm fences, to which purpose it is well adapted, resisting the action of frost, and being so thin as to require little skill in laying it, so as to make the most durable fence known. That part used for making cement is on the top, and consists of two layers, from three to four feet thick. "Color, drab, dull in its fracture, and composed of minute grains with usually but few lines of division." The upper of these courses burns more easily than the lower. When burned, it is ground fine, and mixed with sand; one part of lime to from two to six parts of sand, according to its quality and the speed with which it is desirable the cement should *set*. Owing to its property of preserving its form and hardening under water, it is used with stone or brick in the construction of cisterns, and without any other substance but sand for pipes for conducting water from springs. Such is its strength, that a cylinder of pure cement and sand, six inches in diameter, of one inch caliber, buried three feet in the ground, after some years, became closed at the lower end, and the pipe sustained the pressure of a column of water forty feet in height. The best practical tests for persons unskilled in judging of the quality of this lime for cement, are: The stone, when burned, must not *slake* on the application of water; when ground, the cement must *set*

quickly on being wet; keep its form under water, and harden until it becomes as hard as a well burnt brick. It is sometimes injured by being burned too much, and very often it is not ground fine enough. Mr. Delafield says, of water lime, "If it contains twenty per cent of clay, it will slake, but will also cement. If it contains an amount of clay equal to thirty per cent, it will not slake well, nor heat, but forms an excellent cement" Sganzin, in his work on Civil Engineering, says (p. 20): "Being master of the proportions of hydraulic lime, we can give any degree of energy required. Common lime will bear even twenty per cent of argile, medium lime; that is, that which is a mean between the common and meagre lime, will take from five to fifteen per cent of argile. When we augment the quantity to forty parts of clay to one hundred of lime, the lime does not slake, the mixture is pulverant, and when moistened, it becomes solid, immediately, when immersed in water." The Onondaga Water Lime is simply an impure lime, having clay enough in it to make it resist the action of water. Large quantities of hydraulic cement are manufactured from our rocks, and sent in barrels wherever required.

There are some courses of this group, known by the local name of *blue lime*, which being too pure in lime for cement, are burnt for quicklime, and are also used for building purposes. Six varieties of fossils found in it, are represented in the State reports.

Localities. About three-fourths of a mile southwest of the village of Manlius, this rock forms the "falls" in Limestone creek. "The lower layers contain a large proportion of ordinary lime, free from all accretions of a silicious nature, and therefore make a first quality of lime." The most extensive exposure of water lime is about a mile south of the village, at Brown's saw mill. Butternut creek, below Jamesville, near Dunlop's mill, exposes it in large quantities. It is also found in Onondaga Valley, and Split Rock quarry, where it appears in the face of the precipice all along for miles. The only additional localities, necessary to mention, are the crossing of Nine Mile creek and Skaneateles creek, over the rocks. The width of surface, underlaid by water lime, varies constantly; small outliers, in some places, extend over the gypsious group—but in many places the outcrop is precipitous. On the whole, perhaps, the average width of land on the outcrop, is not more than a quarter of a mile.

ORISKANY SANDSTONE.—This rock is next above the water lime. "In this county it is of variable thickness, owing to the uneven surface upon which it was deposited."* At Manlius, it is but a few inches in thickness, while to the southwest of the village of Onondaga Valley, it is seven feet, and at Split Rock, there is only a trace to be seen. Again it thickens, and on the road from Elbridge to Skaneateles, it is about thirty feet thick. This sandstone, with some exceptions, consists of medium sized quartz sand, such as is derived from the primary rocks. The fossils are interesting, and may be found represented in the State reports. Some of this stone from the Skaneateles quarries was used in constructing locks when

* Vanuxem.

the Erie canal was first made, and was found to wear very well. It is used in the vicinity of the quarry for various structures.

ONONDAGA LIMESTONE.—The next in the ascending order is the Onondaga limestone, reaching, in a well defined wall across this county, and easily traced from the Helderberg, near Albany, to Lake Erie. This rock may be easily recognized by its many fossils, its gray color, crystalline structure and toughness. "It abounds in smooth, encrinal stems [*Enerinites lavis*] which is found only in this rock in the State. Some of these stems are about an inch in diameter, and usually they are over half an inch. In almost all cases they are replaced by lamellar carbonate of lime." * At Split Rock, where it is extensively quarried, it is twenty-four feet thick. Its power to resist the action of air, water and frost—its strength and ability to sustain great weight, without crushing—the ease with which it may be worked—its evenness of texture and soundness, giving it capability of being worked into elaborate mouldings—[the Court House in Syracuse, presents a sample of this quality]—render it the most valuable stone for building of any known in this country. It is used as a marble, bearing a high polish, and presenting a beautiful appearance when so polished as to bring out the fossils perfectly. The Rochester aqueduct, and other principal structures on the enlarged Erie and Oswego canals, in this vicinity, have been made from this stone. It is generally, nearly pure lime, and when burned, will, in the process of slaking, so increase in bulk, that two parts become five.

Its analysis, by Lewis C. Beck, gives

Carbonate of lime,.....	99.30
Oxide of iron,.....	.20
Insoluble matter (silica and alumina),.....	.40
	<hr/>
	99.90

The slaked lime is of the purest white. This rock forms terraces in some places; at others, it presents perpendicular walls for its whole thickness. The two most marked precipices, are the one at Split Rock, and the other northwest from Jamesville, near one of the Green lakes. The top of the one at Split Rock is 810 feet above tide. Very little of the surface is exposed; the overlying rock, in most cases, covering, and extending to, and forming part of the perpendicular precipices before referred to. The local name is *gray lime*. The directions of the vertical joints of this rock are, N. 33° to 35° E; and S. 55° to 57° E.; dividing the benches into convenient sizes for working. The surface shows slight scratches, running north and south. "The lower ledges of the limestone frequently contain black pebbles, whose water worn character admits of no doubt. When fractured, they show identity with the sandstone nodules or accretions found in the Oriskany sandstone." *

CORNIFEROUS LIMESTONE.—Next above, and lying on the Onondaga, are the Corniferous, and Seneca Limestones, which are divided in the State

Reports, merely because the upper measures have a fossil not found below. [*Strophomena Lincata*.] The line of division between the Helderberg series, and the next above, is determined by these fossils.

Corniferous is the name given to this limestone, by Prof. EATON, in his survey of the Erie canal, from its containing flint or horn stone, in nodules, arranged in parallel layers. The lime furnished by this rock is not pure, especially the lower layers; the upper, or what is called Seneca Limestone, are extensively quarried at Marcellus, showing vertical joints, and giving nearly square corners. The courses at the top of the quarry are about seven inches thick, and lie immediately below the Black Shales; lower down, they are thicker. The Corniferous Limestone may be traced by its outcrop all the way through the county; the top of the rock, sometimes barely covered with earth, presents plateaus that slope to the south and west, in the direction of the dip. Near Manlius village, west of Jamesville, and north of Onondaga Hill, these plains are widest.

The general width of this exposure of Corniferous and Seneca limestone, is less than half a mile. At Split Rock, it is 849 feet above tide, and is forty feet thick. With it terminates the Helderberg division.

MARCELLUS SHALES, is the name given to the black rock that rests on the Helderberg range. "It is characterized by its color, and by exhaling a bituminous odor when rubbed. It is a slate, thin bedded, and easily broken, and disintegrates rapidly under the action of water and frost. The silico-argillaceous matter predominates over the calcareous. There is sufficient lime to effervesce with mineral acids. The lower part of the rock is more highly charged with lime than the upper."* It contains small particles of coal, and many excavations have been made in it, in the hope of finding this valuable mineral in sufficient quantities to make the mining profitable. These excavations are no longer made, as the general spread of geological knowledge has taught the public that there is no hope of finding coal in this rock in remunerative quantities. Its peculiar fossil is the Marcellus goniatite, which, with some others, is represented in the State Reports. It also abounds in oval bodies, called Septaria, which "are impure limestone, the materials of which were deposited along with the shaly matter; but in consequence of the play of affinities, the calcareous part separated from the great mass of shaly matter, and the molecules combined to form the bodies under consideration. During the process of drying, the argillo-calcareous matter shrinks and cracks, forming thereby septa, which are subsequently filled by infiltration, either with calcite or the sulphate of barytes or strontian."* At Manlius, a black limestone, from five to ten feet thick, is found in the midst of the shales. It is weathered out into extremely rough masses, so that the persons who work it, usually call it *chawed rock*. Its composition does not differ materially from that of the septaria; and will increase in value and importance when it is known that these masses make the true Roman cement.*

There is a *fault* in this rock, about a mile west of Manlius village. It

* Emmons.

is quite local. At Marcellus numerous sink holes exist in the underlying stones, into which portions of the upper masses have fallen. This shale is said to be thicker in Onondaga county than anywhere else, forming throughout the base of the next group, between which, and the one now under consideration, no well defined line of division has yet been observed. The Marcellus Shales, in addition to lime, contain carbonate of magnesia.

The line between the rocks, denominated in the State reports *Marcellus* and *Hamilton* Shales, is not easily determined, except by an examination of the fossils. As we ascend the slope the rocks become more sandy, lose their color and slaty character, until we find ourselves upon those which are in the main silicious, containing very little calcareous or magnesian matter.

HAMILTON GROUP.—"This group abounds in fossils, such as shells, corals, trilobites, fucoids, and a few plants resembling those of terrene origin. In organic remains it is the most prolific of all the New York rocks. (The characteristic ones are represented in the State reports.) It extends from near the Hudson to Lake Erie, and consists of shale, slate and sandstone, with endless mixtures of these materials. They form three distinct mineral masses as to kinds, but not as to superposition or arrangement, though generally the sandy portion is in the middle of the group."* This rock, with the Marcellus Shales, covers a large part of the county, south of the Helderberg range,—appearing in the towns of Manlius, Pompey, Onondaga, Marcellus, Skaneateles, Spafford, La Fayette, Otisco and Tully. The thickness of the Marcellus and Hamilton Shales, by computing the dip, is 691 feet. The top of the group, at a point east of, and near the head of Skaneateles lake, is 1,111 feet above tide. The two points from which this calculation is made, one of them being near the northeast corner of lot eighty-three, of the town of Onondaga, the other on the east side of Skaneateles lake; are distant from each other sixteen and a half miles in a direct line. The whole surface embraced in this distance is cut into deep valleys, running nearly north and south, and at the crossing of every stream that flows down the slopes, the rocks are exposed in steep precipices. In many places they are denuded of their own debris, and as a result, vegetation is comparatively stunted.

THE TULLEY LIMESTONE rests on the Hamilton Group, and marks the line of division between it and the Genesee Slates. This rock varies from fourteen to twenty feet in thickness. It is an impure, fine-grained limestone, "dark or blackish blue, breaking into irregular fragments, owing to the particles of carbonate of lime separating from a mixed mass of innumerable points. It makes a good, but not a white lime."*

It is the most southern mass of limestone in the State. There are two fossils wholly peculiar to it—the *Cuboidal atrypa*, and the *Tully orthis*—which are represented in the State reports. This rock is seen on the west side of Delphi Valley, and at Tinker's Falls, near the county line, "where the water flows over the rock about fifty feet, which projects ten or fifteen

* Vanuxem.

feet beyond the shale beneath it. The usual fossils are present." It also appears at various points in the town of Tully, from which it takes its name. On the west side of the valley of Onondaga creek, and in the vicinity of Vesper it has been burned for lime. It underlies nearly the whole of the town of Otisco. The valley of Otisco Lake cuts it, the outcrop being seen on both sides of the lake. About a mile south of Borodino, in the town of Spafford, it presents a bold wall, from which stone for lime and building has been taken. The line of the outcrop is easily traced along the east side of Skaneateles Lake from this point, until the county line is passed. This rock probably underlies and makes the floor of Cortland valley for a great distance south. The most northerly point at which it appears, is in the northeast corner of the town of Otisco; but from the elevation of the town of Pompey, it must underlie a considerable portion of that town, although it is so covered with soil that it cannot be seen. The Tully limestone terminates all those deposits in which calcareous matter forms an essential part.

THE GENESEE SLATE, rests on the Tully limestone, underlies and forms the hills and most of the soils of the south part of the towns of Pompey, Fabius, Tully, Otisco and Spafford. Vanuxem says of this rock, that it is an argillaceous fissile mass, which, with great propriety, might be termed in English local, geological phraseology, a *mud rock*. The few fossils it contains are represented in the State reports. It may readily be known by its black color, slaty formation and position,—being between the Tully limestone, and the sandstone flags of the base of the Ithaca group.

THE ITHACA GROUP is the last formation that requires a description in giving the geology of Onondaga county. But a small portion of the soil is formed from it, as it merely appears on the tops of the highest hills. Vanuxem describes it as a mass of hard, coarse shale and sandstone, dark in color, often brown after exposure, owing probably to manganese. A characteristic fossil is found near, but south of the county line, at Scott's Corners, the *Interstria strophomena*, which is represented in the State reports. Above these rocks, but beyond the limits of this county, rise the Chemung, Catskill, old red sandstone, conglomerates and coal measures, all presenting a northern outcrop, and having a dip that goes to show that the whole belong to one upheaval from the sea, in which these rocks, which furnish the materials for our soils were formed during those vast periods of time which the Supreme Being has employed in storing up these resources for supplying the comforts that now surround man's happy dwelling places.

MARL AND TUFA.—"Marl is a carbonate of lime, which has separated from its solvent in water; the latter preventing its particles from cohering together, and allowing them to subside in the state of a calcareous mud. It is in many places constantly depositing from waters holding lime in solution."* On the north side of the Helderberg range there are extensive beds of marl that are due to the dissolving of the calcareous rocks of that group. On the south side marl is found in various places, due to water

* Vanuxem.

percolating through limestone gravel that has been transported from the Helderberg group. The southern deposits are inconsiderable when compared with the great northern beds that extend, nearly unbroken, from east to west across the country. The principal localities of the marl due to drift deposits are in the towns of Fabius and Tully. In both these towns, marl has been fashioned into the form of brick, dried and burned for lime, making a very superior article for finishing walls, and selling at about twice the price of lime burned from the common limestone. The lakes of Tully are constantly depositing marl. The waters that supply these lakes run through pebbles of limestone, and are thus charged with calcareous matter, which incrusts every twig or other obstruction that it meets. Cicero swamp is a bed of lake marl. Onondaga and Cross lakes have many feet of it all over their beds. The railroad as it approaches the tunnel east of Syracuse, exposes by the excavation a section of great interest, "showing in the ditch, clay, and two deposits of marl, which separate three deposits of muck, with stumps and roots, chiefly of tamarack or balsam."* Southeast of the village of De Witt, in excavating for the canal feeder, stumps were found some feet below the surface, showing that a forest has been destroyed by some rise in the water, caused perhaps by a dam of drift wood. The trees died and decayed to the surface of the water, the stumps being preserved by the water. In time the pond filled up with alluvium, and again there was a forest of cedars. In the swamp north of the canal, in the town of Van Buren, there is an extensive deposit of marl, and it is found in various other places, in some cases pure enough to make valuable lime, and in others so mixed with earth as to be merely a calcareous clay. There are many localities south of the Helderberg range, where the springs deposit calcareous matter in the form of Tufa. These masses are constantly increasing as the water flows over them, and casts of leaves, and parts of trees, abound in them. Calcareous tufa is found all along the base of the Helderberg range, wherever a spring flows out. Below the gypseous rocks it is seen in large masses. These rocks being permeable to water, this fluid becomes charged with lime, and when it appears on the surface the tufa is deposited. The deposits generally appear at the sides of the hills or valleys near the point where the calcareous waters issue, and continue down in many instances to a considerable distance, should their course be oblique, or above the drains of the valley, else they are arrested by its waters. Sometimes where the deposit has been rapid, a mixture of the earth and marl and the tufa takes place, as on Limestone creek to the south of Delphi. The deposits are numerous in the towns of Manlius, De Witt and Camillus. "Along Nine Mile creek it has the crystalline character of alabaster, showing successive layers also, and in quantity suitable for the smaller purposes for which that beautiful substance is used when polished."* Ferruginous tufa, stained with the hydrate of iron, is found two and a half miles northeast of Syracuse in quite an extensive deposit, on land formerly owned by Mr. Wheeler.

* Vanuxem.

There is another and similar one on Nine Mile creek, below the village of Marcellus. These deposits of ferruginous tufa, and a small one of bog ore, on the Oneida river, are due to the decomposition of rocks containing iron, or are derived from the soil by the agency of decomposing vegetable matter. In the town of Fabius on Limestone creek, there is a large quantity of tufa, showing the three varieties; the earthy, solid (or horsebone as it is called) and ferruginous.

PEAT, OR MUCK, is found in great abundance in the swamps and low grounds. Mr. Vanuxem says that the conditions necessary for its production, are permanent moisture, with a subsoil of either clay or marl, impermeable to water. It is formed of successive growths of vegetation, which have died, and become brown or black. It is so spongy, and retentive of water, that by successive growths it raises its bed, and appears in mounds and hillocks. This is aided greatly, in some localities, by deposits of Tufa, constantly forming beneath it. Usually, the surface is soft, yielding to pressure, and trembling when walked upon. Dr. Jackson found peat in Maine, exhibiting the compact nature and color of coal. It is not used in this country for fuel, so far as known, but the time is not distant when these extensive beds will be of value for this purpose. As a manure, muck is fast coming into use, and soon will be much prized.

VALLEYS AND LAKES.

The evidences of the action of water on the rocks of this county, are apparent on the most cursory examination.

The perpendicular wall of the Helderberg series, is, at Split Rock, not less than one hundred feet in height; and around Green lake, northwest of Jamesville, it rises two hundred feet. This wall extends from east to west, not only all the width of the county, but from the Hudson to the Niagara; not always presenting the bold front we see here, but in a well defined line of escarpment. In various places this wall of hard limestone, with all the superincumbent rocks, has been broken through, forming deep and wide valleys. The first of these, beginning our examination on the east, is the one through which Limestone creek flows. Manlius village is situated on it, and the falls of the creek, in and south of the village, are over the edges of the limestone. The destruction of the whole rock is not so perfect here as in some of the other valleys. Butternut creek flows through a similar break in the wall. The valley of the Onondaga is the widest, and the destruction of the whole range is here the most extensive. Perpendicular walls of corresponding strata of the Onondaga limestone, appear on both sides of the valley for miles, as it is followed to the south, projecting from the hill sides, four hundred and fifty feet above the creek, at the village of Onondaga Valley, until, by the southern dip and the rise of the bed of the valley, the limestone crosses under the alluvium, about six miles south of the village. The next is the valley of the Nine Mile creek; and the next, and last, is that of the Skaneateles. The action of water against the Helderberg range is most plainly exhibited around Green lake, near Jamesville. This lake is situated in what appears to have been

a bay, in a rock bound coast. The rock has been torn away in a direction nearly west from the main break in the range, and a lateral branch of Butternut creek valley is thus formed, extending for nearly a mile at right angles with the main excavation. The end of this gorge is semi-circular, measuring about a quarter of a mile across, and the lake, having a surface of about ten acres of deep green water, lies in this basin, two hundred feet below the top of the walls that encircle it, except on the east side. It is sixty feet deep, giving for the whole depth of the chasm, from the top of the rocks, two hundred and sixty feet. Immediately north, and parallel with this excavation, is another, quite similar in form, but having no water in it, and being only about two hundred feet deep. The wall of rocks between these chasms is, at one place on the top, only sixty-six feet wide. The precipices are nearly perpendicular. Still farther to the north and west, the rocks are cut and denuded of soil, by the action of water; and the upper layers of corniferous lime are, at the west of the two main excavations, torn away, and form a semi-circular wall, reaching around them both, with an inclined surface from the main precipices to the foot of the second wall. The forces that here operated, appear to have had the power, not only to drive back the walls, but to dig deep in the immediate front of them, and carry away the material. These excavations are all deepest at their west ends. The valley of Green lake being filled up on the east end with debris, somewhat above the surface of the lake, there is no apparent outlet, but the waters are discharged through the seams of the rocks under it. Within less than half a mile of this pond, to the north-west, there is a valley running east and west, which is cut entirely through the Helderberg range to the salt group, leaving, to the north, an out-lying hill, on the top of which the corniferous lime appears undisturbed. Through this valley runs the Syracuse and Binghamton railroad, and the plank road from Syracuse to Jamesville. The level bottom is a cedar swamp. The south side of this valley, as seen from the railroad, is a perpendicular wall, with a talus of crumbling stones at its base. The direction of this wall is about east and west. On the top there is a plain descending to the southwest as the rock dips, as before said, having very little soil on it. Near the edge of the precipice, the seams of the corniferous and the Onondaga lime, are opened in lines parallel to the edge, so that persons may go down in them many feet. This shows that for a distance of a hundred feet the wall has moved outward, as this is the only way the seams could have been opened. The effect of water against the face of a cliff like this, that has hard and thick masses of stone on its top, and soft underneath, would be to wear out the soft shales below the hard courses; and thus, their foundation being removed, they would first tilt, and then finally fall outward. In this locality, the action of water against the cliff ceased after the edge commenced moving, and before it fell off. The localities here described are illustrated in the drawing. The top of the picture is south; the right hand, west. Green lake is seen, with the encircling walls of

corniferous lime, at the top. The excavation without water, is immediately below the lake; lower down is the valley through which runs the railroad. The out-lying hill, showing the corniferous lime on its top, is seen in the lower left hand corner.

The five great valleys, viz: the Limestone, Butternut, Onondaga, Nine Mile creek and Skaneateles, extend from the salt group of rocks south, entirely across the county, and all of them open into others that extend farther south. Near the south line of the county, in each of these valleys, there is a summit, where their waters divide, running north to Lake Ontario, and south, to Chesapeake bay. The lime rocks that were torn up and broken where the Helderberg range crops out, are strewn along these valleys, in the form of boulders and gravel, far to the south, filling them with drift, from which flow the waters that form the marl depositing lakes of the Cortland valley.

Wells, sunk in this gravel, yield water strongly impregnated with lime. These boulders, and this gravel have been transported by water flowing from the north to the south. The power necessary to transport such large masses, for so many miles, must have been very great. The Tully limestone is a hard solid mass of thick courses, but it has not only been torn up from its bed in these valleys, but large blocks have been carried a distance of twelve miles. The fact that the broken fragments of these rocks, which are easily identified by their fossils, are many hundreds of feet higher, and far south of their original position, proves that they were transported by the same forces which broke through the ranges. An opinion has been expressed that these valleys were formed by great rivers, which have dwindled down to the insignificant streams that now meander from hill side to hill side, through the alluvium. This opinion is disproved by the fact, that the transported limestones are south of their original positions, which is up stream, as the waters now run, and also by the fact that the opposing walls of hard lime rock, from between which, hundreds of feet in thickness have been excavated to form Onondaga valley, are not less than two miles apart. A chasm cut, by a river, through a rocky barrier, is narrow; even the great Niagara runs between walls less than a fifth of a mile asunder. It is not supposable that any rivers could have made these wide openings in the line of these rocks, which open like a funnel to the north, presenting just the shape demanded by the theory, that the force that excavated them came from that direction.

Besides these north and south valleys, there are some that cross from east to west; but they are short in comparison with those already described. The principal of these east and west valleys, is near the south line of the county, and may be said to connect the Limestone, Butternut and Onondaga valleys. Another, but much shorter, connects the Onondaga with the Nine Mile creek. At Monfredy's Mills, the Marcellus Shales are all cut away, and the Corniferous limestone is exposed. The west branch of Onondaga creek flows through this valley, its head waters reaching nearly to Nine Mile creek. Still another extends from Limestone creek, below

Manlius, to Butternut creek, below Dunlop's Mills, where it connects with the one through which the Syracuse and Binghamton railroad runs, thus connecting these streams with the Onondaga. The valleys of Onondaga and Oneida lakes are nearly east and west.

All these are valleys of excavation ; not excavated by the waters now in them, but by those of ages long past, of which we know nothing, except as we read their history in the marks they have left upon the earth's surface, and judge of them by the testimony of the rocks. Mr. Vanuxem says, that the larger portion of the rolled stones in every one of these valleys and on their dividing hills, are of northern origin, consisting of primary rock, gray and red sandstone, the latter sometimes showing its *Fucoides harlani*, and amongst them, occasionally, some of the harder varieties of Pulaski sandstone, with its peculiar fossils. These stones are in such prodigious numbers, that their existence, can only be accounted for satisfactorily, by the extension of the rocks north, which, by their dip, would gradually bring them upon the same plane. Immediately south of the Corniferous limestone, there is, generally, a narrow strip of surface on which this rock is found scattered and much worn by water. Mingling with these loose stones, is an occasional granitic boulder. At the base of the Helderberg range, on the Gypseous Shales they are frequent, and, in some cases, are a great inconvenience to the farmer, their removal costing much labor. They are made into fences, if small enough to be handled, if not, holes are dug by their sides, and they are buried out of reach of the plow. Fire is resorted to where the rocks appear likely to divide by its action. The process is to make a brisk fire on one side of the mass, and by expanding that side by the heat, cause it to split off; it, however, not unfrequently happens that only a thin scale is removed, and then the drill and powder must be used.

LAKES.—A marked characteristic of the geography of Central New York, is that group of internal lakes that discharge their waters by the Oswego river into Lake Ontario. The largest of them is ONEIDA, its surface having been computed at fifty-seven thousand acres. It bounds the northeast corner of Onondaga county, a small part only, lying within it. Its surface is three hundred and sixty-nine feet above tide, and its depth is not more than sixty feet. Like all our interior bodies of water, it is in a valley of excavation ; probably the Oswego gray sandstone forms its bottom, though now covered with drift. This lake is navigated by steamers, and is connected with the Erie canal by a short line of canal near the east end, and with the Oswego canal by Oneida river.

ONONDAGA LAKE, which lies adjoining the city of Syracuse, is about six miles long, and averages about a mile and a quarter in width. It is connected by its outlet, which is about half a mile long, with Seneca river, and thus with the Oswego canal. Its surface is three hundred and sixty-one feet above tide, and its greatest depth sixty-five feet. It possesses great interest from the salt wells around its shores, and a more minute

description will be given of it when treating of the sources of the salt water.

OTISCO LAKE is about three miles and three-quarters long, and a little more than half a mile in width. It is of no great depth, and occupies a part of Nine Mile creek valley, which is here excavated in shales of the Hamilton group. Situated deep within hills that rise abruptly from its waters, ten or twelve hundred feet, it presents pictures of great beauty, as it is seen from the various points of view these hills afford. Its surface is seven hundred and seventy-two and a half feet above tide.

SKANEATELES LAKE, rounds off the southwest corner of the county, and has, near its south end, the point of junction of Onondaga, Cayuga and Cortland counties. It is, perhaps, the most beautiful sheet of water in Central New York. Its general course is from north-west to south-east, and it is sixteen miles long. The average width is more than a mile. Its surface is eight hundred and sixty feet above tide. At the north end, and for about half its length, the land slopes gently to the water, and is in a high state of cultivation, dotted with first class farm buildings, and the whole landscape presents objects of beauty, such as the eye loves long to dwell upon. The southern half of the lake is enclosed between high and abrupt hills, that rise nearly two thousand feet above tide. Between these hills the lake is narrower than it is to the north, and the shadows that are cast by the dark forests that still stand on the precipices, give the waters a deep blue appearance, which is heightened and intensified by their great depth and perfect purity. This lake is an excavation in the Hamilton group, and is three hundred and twenty feet deep, about midway of its length. The Tully limestone is seen outcropping on both its sides, for six or seven miles from its southern extremity, in masses nearly or quite twenty feet thick, and on a line nearly three hundred feet above the water. This lake has been navigated by steamboats at different times, but the demands of business have not been sufficient to make them profitable.

CROSS LAKE, is a shallow body of water, lying on the west bounds of the county, and takes its name from the fact that the Seneca river runs through, or *across* it, entering the west side, near the south end, and passing out of the lake on the east side, opposite the point of entrance. It is about five miles long, from north to south, and of an average width of one mile. The shores are low and marshy; the bottom is a bed of marl, precipitated from the calcareous matter brought down by the Seneca river.

Besides these lakes, there are many ponds, that perhaps deserve notice. In the town of Manlius, on lot fifty-six, are two remarkable bodies of water, called by the various names of "Crater Lakes," "Green Lakes," and sometimes one of them is called "Lake Sodom." They are near each other, in the same valley, and are connected by a small brook, which flows from the southwest, or upper, to the lower pond. The upper one, or Lake Sodom, which is by far the most interesting, is nearly circular, having a diameter of a quarter of a mile, and a depth of water of one hundred and fifty-six feet. The surface being one hundred and fifty feet below the top

of the banks, that in a circular form surround it, except on one side, makes the whole excavation over three hundred feet in depth.

Lake Sodom is forty-four feet above Onondaga lake. The lower pond is quite like the upper, except in its form, having a prolongation on its eastern side, running for nearly half a mile between gradually declining hills. It is one hundred and sixty-five feet deep. Both these bodies of water are in the gypseous rocks, and a quarry of this mineral is worked on the banks of one of them. To these rocks the waters owe their peculiar characteristics. Dr. Emmons found in a gallon, one hundred grains of saline matter, a large part of which was sulphate of lime, "with a sufficient quantity of crenate of lime to impart a bitter taste." Prof. Silliman says of Lake Sodom: "The bottom is a grass green slate; the sides white shell marl, and the brim black vegetable mold; the waters perfectly limpid. The whole appears to the eye like a rich porcelain bowl, filled with limpid nectar. But to the taste it is the Harrowgate water." Dr. Beck says, that "the water drawn from the bottom of the pond, is strongly charged with sulphuret of hydrogen. It blackened silver powerfully, and gave copious precipitates with solutions of oxalates of ammonia and muriate of barytes, indicating the presence of sulphureted hydrogen and sulphate of lime. Its specific gravity was scarcely above distilled water, and it contained not even a trace of iron. Thus we have here a spacious sulphur bath; a fact which exhibits, in a most striking manner, the extent and power of the agency concerned in the evolution of this gas." These ponds are favorite resorts for parties of pleasure, and insignificant as the upper one is, in size, such are its surroundings, united with its colored waters, that there are but few single points where the eye takes in at a glance, more that excites wonder, mingled with delight. Approaching this crater-shaped basin from the north, we pass through fields of grain and grass, for half a mile, or more, from the road that runs along the south side of the canal, till suddenly we are arrested by the nearly perpendicular declivity that reaches from the level plateau we have been crossing, to the edge of the dark green waters, one hundred and fifty feet below, and nearly under us. From this point, the basin appears to be an entire circle, the outlet being hidden from view by the curving form of the hills, and the dense forests of evergreen trees that yet remain. The whole is seen at once, and having still in mind the impressions made by smiling wheat fields, and rich pastures, the change of sensations is most rapid, and wide. An afternoon's sun and a brisk wind, conjoining to deepen shadows, and sway the trees, the visitor will find himself at once delighted and awed, and will wonder why a picture so interesting has not attracted more notice from tourists, and scientific inquirers. Various theories have been given of the origin of these ponds. The form of the upper suggests volcanic; hence the name, *crater*. But the circular form, and precipitous banks, are all that favors this supposition. There are no marks of fire, or signs of upheaval to be seen. The vernicular lime projects, in undisturbed layers, from the sides, and the strata all around correspond. High geological authority has given *subsidence* of the

bottom, as the cause of the peculiar form of the basins. To sustain this view, the many sink holes of the gypseous rocks are cited, and their strong resemblance to one of these basins, is urged as proof of similar origin. This renders it necessary to suppose, that the immense mass of earth that once filled the basin, has been carried away by underground veins of water, or that it has been dissolved, and removed by the slow process of filtration. The resemblance to the small sinks fails, when we consider that a stream of water runs from these ponds, and that the circle is incomplete. The small sink holes have no water in them, and they are on land high enough to permit the material that has disappeared to have been carried off by water. Full examination into all the facts, leads to the conclusion that Mr. Vanuxem is correct in calling the valley one of excavation. It is continuous, reaching from the canal, where it is wide-mouthed, for the length of both ponds, the space between, and on further to the south-west, in the direction of Fayetteville. Little difficulty would exist, but for the great depth of the ponds, the upper being one hundred and fifty-six, the other one hundred and sixty-five feet deep. Aside from these depressions filled with water, the whole valley presents nothing to mark it as differing greatly from many others that have been scored out of the slope of the gypseous rocks. What should cause such deep excavations—by what whirling of the waters the materials should have been removed, we do not fully know; but it is easy to suppose that these soft rocks could as well be dissolved, and carried off, by a great body of water acting over the surface, as by the little rills that circulate under and through the earth.

Having studied the series of rocks that should lie under these excavations, and calculated their dip from the points of their outcrop to the north, we find that the Niagara limestone cannot be far from two hundred feet below the surface of the water. This is a rock that is not easily dissolved, and must form an unbroken bed, within less than forty feet of the bottom of the deepest pond. This floor is in the way of any supposed subsidence, and disappearance of three hundred feet in thickness of the measures of the Salt group. Difficult as may be the supposition that this whole valley was made by water acting from above, it is still more unsatisfactory to suppose, that water acting below was adequate to the work.

The Green lake, near Jamesville, has been before described, and it is only necessary here to say, that it is situated higher, is excavated in the face of the Helderberg range, and is partly surrounded by these hard rocks which rise in perpendicular walls, while precipitous slopes take their place in the ponds in the gypseous shales, which are too soft, and liable to disintegration to stand upright.

In the valley that runs from the Limestone to Butternut creek, there are some small ponds below the level of the large masses of gypsum that outcrop in the hills on both sides, that are similar in their general characteristics to Lake Sodom, but not so interesting. The wall of lime rocks that runs along south of these ponds, has many fissures and caves. One of these caves was formerly a place of resort, but is now closed from visi-

tors. Clark, in his Onondaga, describes it as follows: "Nathan Beekwith, in sinking a well about a mile east of Jamesville, in 1807, discovered a large cavern. It has been explored, to some extent, in a southwesterly direction, from the entrance at the well. The depth, at the entrance of the cavern, may be about twenty feet; height of the cavern, at the entrance, about seven feet; width, near five feet. These dimensions continue six or eight rods, when the space becomes contracted to a width just sufficient for a single person to pass through. It soon becomes broader. The size is very far from being uniform; the top, in some places, being not more than three or four feet from the bottom. Dog-tooth spar, stalactites and stalagmites are numerous. A small stream of water runs along the bottom. The man who dug the well, while in the act of drilling a hole of some ten or twelve inches, saw his drill suddenly sunk into the cavity up to the bulge. Upon withdrawing the drill, a strong current of air came up and continued until the hole was sufficiently enlarged for the purposes of a well. The stream of air would instantly extinguish a lighted candle, and after it was enlarged, would keep coals alive and in a glow. A melancholy circumstance is connected with the discovery of this cave. A young gentleman and lady residing in Cazenovia, and newly married, came out on a pleasure ride to see the cave. It was on a very warm day in the month of August. They descended into the cave and remained there three hours. They became completely chilled; both were taken suddenly ill, and both died within one week from the day they entered the cave. The entrance is now closed, so that there is no admittance to it. About two miles west of Jamesville, in the same geological formation, is another cave, that has never been thoroughly explored. The entrance is a mere fissure in the rock, about three by eight feet. There are traditions connected with this cave, which are, probably, without foundation, in fact, that a silver mine existed here; that tools used for mining purposes, a bar of solid silver, and a kettle of money had been found near the entrance. "Money diggers" have spent much time and labor in a fruitless search for these imaginary treasures.

On the south side of the county, at the summits of the valleys, there are a number of small bodies of water. The principal of these is crossed by the county line, part of it lying in Cortland county. This pond is twelve hundred feet above tide, and discharges its waters south to the Susquehanna. There is nothing of special importance demanding any further description of these waters.

Near the old Seneca turnpike, on the line between this county and Madison, is what is known as Deep Spring. Its Indian name is Te-ungh-sat-a-yagh. Not far to the north of it is the line of the junction of the Marcellus Shales and the Corniferous limestone. This spring is a subterranean stream of considerable magnitude in wet weather, that here finds a seam in the lime rock into which it discharges and disappears. The shales above the stream, have fallen piece by piece into the water, and been carried away, forming a circular cavity about twenty feet deep. The waters appear but to disappear. The cavity is about sixty feet in diameter at the top,

and slopes in steep banks to the water. On the north side, some artificial work has made it accessible. It is noted on the old maps as the starting point for important surveys. The banks have, still on them, large forest trees, marked with names of visitors, and dates, as far back as 1793. The Indian path from Oneida to Onondaga, passed near it, as did the first public road. In the Revolutionary war, a scouting party of six white men, from Fort Schuyler, stopped at this spring to drink, carelessly leaving their arms on the bank without guard. A party of Indians arriving soon after, and finding the whites thus, accidentally, in their power, massacred them all. Arrow heads, hatchets, bullets, bayonets, and other evidences found in the vicinity, bear testimony of even more deadly affrays. Tradition says, a severe battle was fought here during the Revolution.*

MINERAL SPRINGS.

Mineral springs are found at various points along the north side of the Helderberg range, and on the Salt Group. In the town of Manlius, a short distance south of the village of that name, there is a spring that has a strong sulphurous taste. By analysis it was found to contain "sulphureted hydrogen, carbonic acid, sulphate of soda, sulphate of magnesia, carbonate of iron, and carbonate of lime. These waters are considered beneficial in cutaneous diseases, and are highly diuretic." "About a mile north of Manlius village, are three medicinal springs near each other, the waters of which are feebly charged with sulphureted hydrogen. They have a slightly saline taste, and contain sulphate of magnesia. Formerly these waters were considerably resorted to, and were known as Elk Horn Springs."

MESSINA SPRINGS are in the town of De Witt, about three and a half miles east of Syracuse. They are three in number, about twenty feet apart. The waters rise through a limestone formation, having calcareous tufa on the surface. Temperature of the water, 50° F. It has a strong sulphurous taste, but is not so highly charged with the gas as other springs. When it has been exposed to the air, for a few hours, it becomes milky, no doubt in consequence of the decomposition of the sulphureted hydrogen, and the subsidence of some of the less soluble salts. Its specific gravity is 1.00305; and its composition, in a pint, is:

	Grains.
Carbonate of lime,.....	1.85
Sulphate of lime,.....	8.55
Sulphate of magnesia,.....	1.36
Chloride of calcium,	1.83
	<hr/>
	18.09
	<hr/>
	[Beck.]

Syracuse has a spring about two hundred yards from the salt well, which has attracted some notice, and may yet be found of great value in the cure of diseases. Mr. Beck says, its waters are strongly charged with sulphu-

* Clark's Onondaga.

reted hydrogen gas, and that they contain some carbonic acid, together with a large proportion of saline matter. The water is perfectly transparent, blackens salts of lead, but has scarcely more than a trace of oxide of iron. Its specific gravity is 1.01426. One pint contains:

	Grains.
Carbonate of lime, with minute portions of oxide of iron and silica,	1.74
Sulphate of lime,	7.97
Chlorides of calcium and magnesium,.....	1.07
Chloride of sodium,	122.86
	<hr/>
	133.64

Another spring, quite similar, near the Salina well, he reports as having in one pint:

	Grains.
Carbonate of lime, with minute portions of oxide of iron and silica,	0.58
Sulphate of lime,	11.18
Chlorides of calcium and magnesium,.....	0.96
Chloride of sodium,	173.69
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	186.41

gaseous matters, sulphureted hydrogen, with a minute portion of carbonic acid. He says of these waters, that they seem to be weak brines, charged with sulphureted hydrogen.

These springs, within the bounds of the City of Syracuse, are not appreciated as they deserve. The busy scenes that surround them are not favorable to the erection of fine capacious "cures" for the sick, and there is no room for groves and sylvan walks around them. Nevertheless, the absolute curative qualities of the waters are here, and ready to be used.

Besides the springs that have been noticed, there are several along the north side of the Helderberg range that are used by the people around them medicinally. Near Split Rock, about on the line between the towns of Onondaga and Camillus, is a small white sulphur spring that has been found of value in cutaneous diseases. There is a magnesium spring a little north of the village of Elbridge, that runs out of the vernicular rocks on the east side of Skaneateles creek; its water acts as a vigorous cathartic. Just above this spring, gypsum has been quarried in small quantities. Sulphur springs in Camillus and Van Buren, and in other places, might be noticed, if space would allow.

CHAPTER III.

SALT SPRINGS.

The earliest history of these springs we have received from the Jesuit missionaries. Father Jerome Lallemant, in his "Relation," says "the Onondagas have a very beautiful lake called Ganentaha, on the shores of which there are several salt springs, whose borders are always covered with very fine salt." To Father Simon Le Moine is due the credit of first bringing the salines into notice. He visited the Onondagas in 1654, on a mission of peace, and from his "Relation" of his returning journey the following extract is made. Under date of August 16th, he says: "We arrive at the entrance of a small lake in a large half dried basin; we taste the water of a spring that they [the Indians] durst not drink, saying that there is a demon in it, which renders it fetid. Having tasted it I found it a fountain of salt water; and, in fact, we made salt from it, as natural as that from the sea, of which we carried a sample to Quebec." This account gives evidence that the natives had not made salt from the water. It is strange that the wild animals that then so abounded, great herds of deer, and what he called wild cattle, being seen, and many killed by the missionaries' men, did not teach the Indians that these waters contained a condiment of great value. Salt "licks" must have abounded, and the constant visits of the deer to them, it would seem, should have furnished hints that would have led to the evaporation of these waters, and to the use of their contents. But it remained to Father Le Moine to exorcise the "demon," to whose dominion the superstitions of the children of the forest had given the spring, by the simple process of putting fire under a kettle. Thenceforth it was shown that a good spirit was there; and from this time salt must have come into use among the Indians.

Frequent allusions are made after this date, by the Jesuit fathers, to the salt springs. In 1770 Onondaga salt was in common use among the Delaware Indians, and by that time traders were in the habit of bringing small quantities to Albany, along with their furs, as a curiosity.† But this was long after Le Moine had taught the Indians to make salt, and no account of its manufacture among them has been discovered during this period. Now it was to be found, says Judge Bowker, in the Indian huts, the women manufacturing it, and sending it to Quebec for sale. Sir William Johnson, some years before this, obtained a conveyance from the Indians "of a tract one mile in width, adjoining and including the entire lake," as appears from a letter of Comfort Tyler. If this was a good title, then Sir John Johnson, who succeeded his father, Sir William, lost by his loyalty to England, not only his principality on the Mohawk, but the more valuable property of Onondaga Lake and its environs.

The first account of the existence of these springs, given by Father Le

† Clark.

Moine, was pronounced by the Dutch of New Amsterdam "a Jesuit lie," and their successors appear to have regarded them as of little or no importance until after the Revolutionary war.

Comfort Tyler, in 1788, was shown the spring by the Indians, and in the month of May of that year he made, in about nine hours, thirteen bushels of salt. His account of this first manufacture of salt by the race of men who now carry on the business, is as follows: "The family wanting salt, obtained about a pound from the Indians, which they had made from the water of the springs upon the shore of the lake. They offered to discover the water to us. Accordingly I went with an Indian guide to the lake, taking along an iron kettle, of fifteen gallons capacity, which he placed in his canoe, and steered out of the mouth of Onondaga creek, easterly into a pass called Mud creek. After passing over the marsh, then overflowed by about three feet of water, and steering towards the bluff of hard land, since the village of Salina, he fastened his canoe, pointed to a hole apparently artificial, and said there was the salt."

On the 12th of September following, the treaty of Fort Stanwix was made, by which it was stipulated that "the salt lake, and the lands for one mile around the same, shall forever remain for the common benefit of the people of the State of New York, and of the Onondagas, and their posterity, for the purpose of making salt."

Thus the two races of men became tenants in common, of this property. A circumstance, curiously illustrating Indian ideas, grew out of this common ownership.

The white men at once took possession of the salt water at what was called Salina, now the first ward of Syracuse, and commenced the manufacture of salt. In 1794 Judge James Geddes constructed a "salt works" something more than a mile to the southwest of that point, across the marsh, or more properly what was then the head of the lake,

The Indians took exception to this, saying that they owned one-half of the water, the white men the other half; and as the whites had taken possession on their side of the lake, they should keep away from what they called the Indian side.

The subtleties of the white man's common law, that gave, as they thought, the whole to one of the owners, were incomprehensible to them. A council of the nation was called, and speeches, in which Indians delight so much, were made. Still the difficulty grew no less. Mr. Webster, who had married an Indian woman, and lived among her people, was kind enough to go and tell the Judge of the trouble, and to suggest the probability of a very unfriendly visit from his dark skinned neighbors. Too much had been done for the work to be abandoned, and resistance was out of the question; so, valuable presents and conciliatory words were resorted to. Judge Geddes appeared before the council, and made his explanations, but could not remove the obstacle to friendly intercourse, by any eloquence he possessed. The Indians did not really desire a quarrel, and they did want the valuable presents. But the clouds deepened, while sunshine was desired

by all parties, and things were fast assuming a threatening aspect, when a happy inspiration in the mind of a wise man, untied the knot. "We will adopt this pale face into our tribe, and then being one of us, he will have a right to make salt on our side of the lake." The proposition was adopted unanimously, and the new brother had the name Don-da-dah-gwah conferred on him, and by it the Indians ever after addressed him. Thenceforth he made his salt in peace.

In 1795, July 28th, a treaty was made at Cayuga Bridge, by which the Indians sold their common interest in the salt water for certain annuities in money, and one hundred bushels of salt, to be delivered on the first day of June, every year thereafter. But to return to our history of the manufacture of salt.

In the year 1788 it is related of Asa Danforth, that he carried a kettle on his head from Onondaga Hollow to the spring at Salina, and with the help of Comfort Tyler, made salt, suspending the kettle by a chain from a pole, supported by two crotched posts. After they had a sufficient supply they hid the chain and kettle in the bushes until again wanted, and, in this way, all their salt was made, until the next year, 1779, when Nathaniel Loomis came by way of Oneida lake and river, with a few kettles, and during the following winter, he made from five to six hundred bushels, which sold for one dollar a bushel. The first kettles, set in an arch, were used by Jeremiah Gould. In 1793, Moses De Witt and William Van Vleck erected an arch with four kettles, and supplied the demand for the whole surrounding country.

In 1798 "The Federal Company" was formed; its members being Asa Danforth, Jedediah Sanger, Daniel Keeler, Thomas Hart, Ebenezer Butler, Elisha Alvord, and Hezebrial Olcott.

This company erected a large building, capable of containing thirty-two kettles, set in blocks of four each. Perhaps, in this way, originated the term "block," which has ever since been applied to a salt manufactory where water is boiled in kettles.

The first laws regulating the manufacture of salt, were passed in 1797; the State then assuming a control that it has never relinquished. The State demanded for the rent of land and the use of the water, four cents a bushel for all salt made, and required that ten bushels, at least, should be made in every kettle or pan used, and provision was made that in case any lessee should not use all the water there might be on his lot, the next neighbor might have the surplus, then the next, and so on, until it was all used.

William Stevens was appointed Superintendent on the 20th of June, 1797, which office he held until his death.

The powers given to the Superintendent were full, and the law entered into minute details in regard to the whole business of making and packing salt. The maximum price was fixed at sixty cents a bushel to citizens of the State, and the maker of the salt must either put it in the public store, or if he kept it in his own building, he must surrender the keys to the Superintendent. No salt could be sold in the leased premises. One cent per

bushel was exacted by the State for storage, and the Superintendent was to take care to have always in store two thousand bushels the first year, and an additional five hundred for each year thereafter, which was to be ready to meet demands of citizens of this State.

The block house that in 1794 had been constructed for defence, was used for the public storehouse. Clark, in his account of these matters, from which most of the particulars here given are derived, says, that the Superintendent gave certificates of deposit of salt in this storehouse, and that these certificates passed from man to man like bank bills.

The manufacture of salt continued to increase as the surrounding population increased, some of it finding a market in Canada. The rivers and lakes connected with Onondaga lake, furnished facilities for transportation in the summer, and in the winter sleighs came from the counties to the south bringing farm produce to exchange for salt.

The time soon came when the Superintendent could not store all the salt; so in March, 1798, it was provided by law, that the manufacturers might account on oath, for the quantity made, and they were allowed to pay rent according to the capacity of their works at the rate of two cents per month, for every gallon of the capacity of their pans or kettles, and were released from the charge of four cents per bushel. Fifty-six pounds was fixed as the weight of a bushel of salt.

In 1799, another law was passed going more into details, even determining the number of hoops on the barrels, the kind of timber of which they should be made, the seasoning of the barrels, and directing that they must be water tight. The Superintendent was to weigh, deduct the tare, then brand the weight and quality, and put on the price per bushel that he judged the salt to be worth, and then brand his name on the wood. This salt, if it went away by water, was to be shipped from the public wharf under a penalty of five dollars for every bushel not so shipped. The Superintendent was required to provide bins to keep each manufacturer's salt until it was inspected.

These, or like minute regulations, continue to govern, and when their rigor has been lessened, it is due to the fact that the magnitude of the business has made it impracticable to enforce them. The opinion that buyer and seller are not competent to judge of the condition of salt, still runs through the laws regulating the selling of salt made from these waters. The inevitable consequences follow. The brand of the State officer is sufficient, and however inferior the condition may be in fact, this brand is the passport over the far prairies of the west. It is not known that any suit has been brought by any sufferer from inferior salt, against its maker, though the law requires that his name, as well as the superintendent's, should be on the package.

Repeated tests have shown that salt made here, is equal to any known to commerce. This is the simple truth in regard to the greater part that has been manufactured, and it is probably true that every year less and less salt that is not in good condition gets into market, but there were

complaints in years gone by, that we must believe were well founded. Had the business been put on the true basis in the beginning, or could it be placed there now, a vast amount of vexatious control would be avoided, and the name of the maker on the end of the package would have to signify something besides compliance with the terms of a very precise statute. Whoever then should sell salt not in good condition, might be made to answer in damages to the purchaser. Under the present system, if the salt maker can smuggle a few pounds of impurities into a barrel, he thinks, too often, that he has added to the coin in his purse, and no purchaser thinks of going behind the official certificate of good quality for redress. Even under this radically vicious system, there have always been a large number of manufacturers who thought more of their own reputation than of the inspector's brand, and in many instances these men have had their reward in receiving prices above the general market. The great mass of the manufacturers would hail with satisfaction, any change that would result in making it absolutely necessary for every one to produce the very best article possible.

The law of 1799 required the Superintendent to report yearly to the Legislature. To this valuable provision we are indebted for much information and improvement.

In 1806 we learn from one of these reports, that 159,071 bushels were made. About 1806 or '7, a great advance was made by the construction of a block of ten kettles, by John Richardson.

During Mr Kirkpatrick's administration, as Superintendent, the well at Salina was dug out, twenty feet square, to the depth of thirty feet, each manufacturer having his own pump worked by hand, the water carried in spouts to his works. In 1810 water power was first used to raise the brine. Yellow brook was brought, in a canal, to turn the wheel. In 1812 a law was passed requiring the Superintendent to lay out two acres of land and lease the same, free of duty, if he thought proper, to induce an experiment to make salt by evaporation, without the use of fire. Thus was suggested a mode of manufacture that has now become general, and bids fair to exercise an important influence on the whole business in future.

In the year 1817 the duties levied by the State were raised to twelve and a half cents a bushel, at which rate they were continued until April 20th, 1846, since which date they have been one cent a bushel, which is intended as sufficient to pay for superintendence, digging the wells, pumping the water, and conveying it to each manufactory in pipes.

These waters have been a great source of revenue to the State, having paid into the treasury from 1825 to 1848, inclusive, \$3,770,872.81, from which is to be deducted \$609,935.54, for expenses during the time, leaving net no less a sum than \$3,160,937.27.

The whole amount of salt made from these waters since June 20th, 1797, which is the date of the first leases, to the end of 1859, is 125,143,710 bushels.

The crop of 1859, boiled and solar, amounted to 6,894,272 bushels ; of this there were 1,345,022 bushels made by solar evaporation.

The average annual product, in bushels, was :

During the ten years, from 1797 to 1806, inclusive,				78,000
do	do	1807 to 1816,	do	..... 267,000
do	do	1817 to 1826,	do	..... 608,000
do	do	1827 to 1836,	do	..... 1,594,000
do	do	1837 to 1846,	do	..... 3,058,000
do	do	1847 to 1856,	do	..... 5,083,000

The Superintendent, Vivus W. Smith, Esq., in his report for 1858, from which this table is taken, estimates that the increase of the production will bring the average of the next period of ten years to 7,510,000 bushels; that the maximum in 1866 will not be less than 10,000,000, and that at the same rate of increase, that is, fifty per cent, for each ten years, over the preceding, the next period would average 15,000,000 ; and the production of the year 1876 would be 20,000,000 of bushels.

The manufacture of what is called solar salt—that is, salt made by evaporation, in wooden vats, without the aid of artificial heat, is increasing rapidly.

It is estimated that there are now in use, and in the course of construction, works of this kind sufficient to produce nearly, or quite, 2,000,000 of bushels per annum.

The salt, both boiled and solar, finds a ready market, and supplies the demands of “a tract of territory four degrees of latitude in breadth, on this meridian, and widening to ten, in the valley of the Mississippi, embracing the most densely populated and productive parts of the American Union, as well as the adjoining British Province of Canada West.”*

These salines, then, are not only of great interest to scientific men, but are of incalculable value to the people of many States. Their geographical position could hardly have been more fortunate. Mr. Smith says, in the report before quoted, “they are virtually at the point where the great lake marine discharges its bulky freights, destined for an eastern market, by canal or railway transportation, and requires a return commodity, to be conveyed at the lowest rates, in preference to not being taken at all. Instances have occurred during the year, in which salt has been taken to Buffalo from Syracuse for five cents per barrel, and five cents per barrel have been paid for it as ballast by the ship-owners on the lakes. The largest portion of our salt, shipped to Chicago and other points west during the year, by Oswego and the Welland canal, has been carried the entire distance, for from eight to twelve cents per barrel. Onondaga salt may be purchased for a lower price in the ports of Lake Michigan than it can be at Cazenovia, twenty miles distant from the works.”

In the year 1830 the first iron tubes were sunk, with a view to procure water from a greater depth. At sixty feet brine was found from twenty-five to thirty per cent stronger than that in the old well. Very soon many

tubes were sunk, and for a long time all the salt water has been raised by pumps through these tubes, and then forced up and accumulated in reservoirs, from which it flows in wooden pipes to the various manufactories. These pumps are driven by water taken from the canal, or in cases where the water power cannot be had, they are driven by steam engines.

For many years the State was paid by the bushel for pumping the water, but in time all the expenses were merged in the one cent a bushel, which now pays rent of land, as well as for the salt water at the works.

The first "salt works" was Comfort Tyler's fifteen gallon kettle; then came the four kettle "block;" then the ten kettle block; and now Thos. Spencer, Esq., makes salt in a block of one hundred and eight kettles of one hundred and twenty gallons capacity each. Mr. Spencer's manufactory is thought to be too long, and about fifty or sixty kettles is the favorite number for a block.

From 1840 to 1842, inclusive, Mr. Spencer was Superintendent of the salt springs, and as such earned a high reputation. To the knowledge acquired in office, he adds that of a manufacturer for many years. He was employed by the proprietors of the salt waters of the valley of the Holston, Virginia, to put their works in operation, and is now extensively engaged in the manufacture of salt both there and here.

Desirous of profiting by his knowledge, application was made to him, and the following letter was received in reply:

SYRACUSE, *July*, 1858.

GEO. GEDDES, ESQ.:

Dear Sir—In reply to your questions concerning the salt manufacture, etc., accept the following statements:

The brine, as pumped from the several wells, is not of a uniform strength, and has been gradually becoming weaker for the past fifteen years.

The hydrometer, or salometer, by which the strength of the brine is measured, marks one hundred degrees, pure fresh water being 0, or zero, and water fully saturated with salt, one hundred degrees.

There are six springs at Syracuse, varying in depth from 270 to 330 ft., in alluvial deposit. The brine is found in a lower stratum of loose gravel, which rests upon a compact hard-pan. These springs furnish brine for the manufacture of about four millions bushels of salt annually, which require about 160 millions gallons of brine. The average strength of the brine from these wells is now about sixty-nine degrees.

There are other springs at Salina and Liverpool which furnish about one half as much brine as the above. Those at Salina are now of the average strength of about sixty degrees, and at Liverpool about fifty-eight degrees.

During the season of 1842, from May to October, the brine from the springs at Syracuse, averaged 77°, from Salina 78°, and from Liverpool 73°. This shows a depreciation in the strength of the brine for the past sixteen years, of 8° from the Syracuse springs, of 18° from the Salina springs, and of 15° from the Liverpool springs. The quantity of salt, however, manufactured annually, has doubled during that time. Consequently the

draught upon our great salt basin, from which source we obtain our supply of brine, has increased in a like ratio.

Whether or not the strength of the brine will continue to decrease in a similar ratio, is a difficult problem to solve and can only be determined by time.

I can best answer your question concerning the impurities and their proportions contained in the brine when pumped from the springs, by giving you the following analysis made by Dr. Lewis C. Beck, in 1837, at which time he was with Mr. Vanuxem and others, engaged in making the geological survey of the State.

LOCALITY OF WELLS OR SPRINGS.	Total amount of solid matter in 1,000 grains of brine.	Carbonic acid.	Oxide of iron and silica with a trace of car e of lime.	Carbonate of lime.	Sulphate of lime.	Chloride of magnesium.	Chloride of calcium.	Chloride of sodium, or pure common salt.	Water with a trace of organic matter.	Total.
At Geddes.....	138.55	0.06	0.10	0.04	4.93	0.79	2.03	130.66	861.39	1.000
At Syracuse.....	139.53	0.07	0.14	0.02	5.69	0.46	0.83	132.39	860.40	1.000
At Salina.....	146.50	0.09	0.17	0.04	4.72	0.51	1.04	140.02	853.41	1.000
At Liverpool.....	149.54	0.07	0.13	0.03	4.04	0.77	1.72	142.85	850.39	1.000

The brine is stronger now than when the above analyses were made, but it is presumed to contain the same proportion of impurities.

The strength of the brine from the several localities at different periods, is as follows :

	June 1840.	June 1842.	June 1851.	June 1853.	July 1858.
Springs at Geddes.....	50 deg.	.....	.....	.....	.....
do at Syracuse.....	56 do	77 deg.	74 deg.	72 deg.	69 deg.
do at Salina.....	58 do	78 do	67 do	67 do	60 do
do at Liverpool.....	65 do	72 do	70 do	73 do	56 do

You ask for a description of the process of manufacturing salt by artificial heat—the kind of erections necessary for the most advantageous process—their cost—the cost and kind of fuel, &c., &c.

The manufactories (or salt blocks as they are called), are of various dimensions, varying from forty to more than one hundred kettles each. The kettles are mostly of the capacity of one hundred and twenty gallons, in form a half sphere, diameter four feet, made of cast iron, and weigh from six hundred to one thousand pounds each. These are suspended in two contiguous rows, on brick walls, with a suitable furnace or fire bed at one end of each row, and the chimney at the other end.

The whole should be covered by a suitable building, with bins extending the entire length on both sides, to store the salt and protect it from the weather, until it shall be ready to be packed in barrels, for market.

Wood is now mostly used for fuel ; but the time is not remote, when coal will be chiefly used, as most economical.

A ton of two thousand pounds of coal, either bituminous or anthracite,

will produce about fifty bushels of salt; and a cord of the best hard wood will yield a like quantity; this gives an evaporation of eight pounds of brine to one of coal.

About twenty blocks are using coal the present season, the cost of which, delivered; is about three dollars and seventy-five cents per net ton of two thousand pounds.

A block consisting of fifty kettles, is, I think, the most suitable size for the use of coal as fuel. Such a block will require about five tons of coal, each twenty-four hours, and would, therefore, produce about two hundred and fifty bushels of salt daily.

The cost of such a block, with its appendages, is about five thousand dollars.

There should be attached to each block three cisterns, each of sufficient capacity to contain as much brine as may be required for two days' use. This is necessary for the purpose of affording sufficient time to precipitate the impurities by chemical agents, before it shall be supplied to the kettles.

Caustic lime was formerly allowed to be used for the purpose of cleansing the brine from a portion of its impurities, but its use is now prohibited. It was frequently used by the operatives, in such profuse quantities, that it was found to produce an impurity much more injurious to the quality of the salt, than that which it expelled. Alum is now required to be used in the place of lime, and its beneficial effects are very obvious,

This change was brought about at the suggestion of Prof. Geo. H. Cook, a very competent chemist, who was employed by the State for the purpose of devising some method of improving the quality of our salt; and those manufacturers who adhere most strictly to his instructions, excel in the article manufactured by them. Much, however, depends upon the skill exercised by the workmen employed in the various manipulations of the brine, after it is supplied to the kettles; and to the difference in the skill and care exercised by them, may be attributed the great difference in the quality of the salt produced.

In reply to your question "How shall a person judge of the quality of salt?" The simplest method is to take pure water and saturate it with the salt to be tested, which for any given quantity of salt will require twice and a half of its weight of water, and stir it until the salt is fully dissolved. If the salt is combined with impurities, the solution will at first have a milky appearance, but after remaining at rest a few hours, the impurities will settle to the bottom of the tumbler or other vessel in which the solution is contained; but if the salt is pure, the solution will be transparent, and there will be no sediment.

It is more difficult to give a satisfactory reply to your question concerning the source of the brine. We only know that we penetrate the earth in alluvial deposit, at various points bordering upon the Onondaga lake, to the depth of from one hundred to four hundred feet, and find the brine in a deposit of gravel which rests upon a hard-pan (impervious to water) which

seems to form the floor or bottom of our great salt basin. All beyond this is mere conjecture.

Eminent geologists who have devoted much time in investigating this subject, have, I believe, uniformly arrived at the conclusion that the source from which our brine is derived, is buried deep beneath the mountains or hills south of us, and is conveyed to the points where we find it, by subterranean currents of water, which have passed through the saliferous material and dissolved it.

I have, however, formed a different opinion, which I give with much diffidence, as it is opposed to the theory adopted by men of science, whose opinions are entitled to much respect.

I am strongly inclined to the opinion that there is deposited, immediately beneath the Onondaga lake, a solid mass of salt rock, which is being gradually dissolved, and flows to the points where we find our brine. This salt rock is overlaid by a heavy sedimentary deposit, which forms the bottom of the lake, and which prevents the salt from coming in contact with its waters.

This theory which locates the salt rock in the valley, instead of beneath the limestone hills south of us, is analagous to the salt springs in the valley of the Holston, in southwestern Virginia, and those in the valley of the Weaver, near Liverpool, England; in both of which places the brine is found in immediate contact with salt rock, and is, consequently, nearly or quite, fully saturated with salt, when it is pumped up and supplied to the boiling works, at from 96° to 100° of strength; and wells have been sunk near the shore of our lake, which have, for a while, furnished brine of 80° of strength; and I know of no other salt springs, excepting those of the above named three localities, the brine of which will approximate these in strength.

The salt rock, in the valley of the Holston, is found in a valley less than a mile wide, on either side of which, abrupt mountains of limestone rise to the height of several hundred feet.

The salt rock is immediately overlaid by about two hundred feet of beautiful white gypsum, and this is covered by about twenty feet of clay.

This mass of rock salt is of unknown thickness. It has been penetrated about one hundred and fifty feet without passing through it.

The salt rock in the valley of the Weaver is found at a depth from the surface of from 200 to 250 feet, and the brine nearly, or quite, saturated with salt, is pumped from the rock-head, and supplied to the extensive manufactories, where from twenty-five to thirty millions bushels of salt, is produced annually, and sent down the Weaver to Liverpool, from whence it is exported to all parts of the world, where it can find a market.

The comparative purity of several varieties of salt may be learned by the following analysis by Prof. Geo. H. Cook:

	Salt from sea water.	Kanawha salt.	CHESHIRE.			DIEUZE.		ONONDAGA.	
			Rough.	Common.	Stoved.	Medium.	Fine.	Solar.	Bolled.
Percentage of moisture	3.75	8.00	2.20	1.10	0.70	0.90	0.30	3.00	1.80
Percentage chl. of sodium....	96.43	98.51	97.61	97.55	98.61	98.48	97.42	98.14	98.84
do do calcium.....	1.26	0.20	0.13	0.01	.....	.....	.....	0.02	0.01
do do magnesium.....	0.73	0.23	0.17	0.12	0.03	0.26	0.20	0.02	0.01
do sulph. magnesia.....	.....	.....	.....	.....	.....	0.04	0.68	.....	.....
do do lime.....	2.04	.....	2.02	2.20	1.35	1.22	1.70	1.82	1.14
do insoluble matter ..	0.35	.....	.....	.....	.....	.....	.....	.....	.....
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

I have also been induced to adopt this theory, from the peculiar formation of the shores and bottom of the lake. On all sides, from one-eighth to one-fourth of a mile from the water's edge, the water is so shallow that a man may wade that distance and keep his head above water. At this point there is uniformly a precipitous bank, where the water is from fifteen to twenty-five feet deep. Beyond this point the water deepens very gradually, until you reach the center of the lake, which is about sixty feet deep.

I cannot account for this precipitous bank, at that distance from the shore, upon any other theory than that it marks the outline of the bed of rock salt, which, as it is gradually being dissolved, allows the loose and soft alluvial deposit, by which it is overlaid, to settle down, by which means this abrupt bank is formed and preserved. Otherwise I cannot perceive why the sediment, which has been accumulating for ages, should not have been deposited more uniformly from the shore to the center of the lake.

This is, however, but an opinion, unsupported by facts; and I have long since learned not to be offended with any one for entertaining an opinion different from my own, on any subject.

Respectfully yours,

THOS. SPENCER.

The peculiar shape of the bottom of the lake alluded to by Mr. Spencer, seems to have escaped the observation of most writers who have speculated in regard to the origin of the salt water. No notice of this unique formation of sedimentary matter has been found in the State reports.

Soundings on the north shore beginning at the water's edge, give

At 500 feet 3.5 feet depth.

do 200 feet farther out, 0. do

do 40 feet do 23. do

do 20 feet do 25. do

do 40 feet do 27. do

do 60 feet do 32.5 do

do 60 feet do 39.5 do

In the middle of the lake, 55. do

Opposite a point two miles from the east end of the lake, the water was

65 feet deep in the middle. At Liverpool, three miles from the east end, the depth was 55 feet. Many soundings have been made, and the general depth is 55 feet. Once away from the foot of the abrupt bank, and the bottom is so level that the deepest place is only ten feet more than the shallowest, and this depression of ten feet is approached very gradually.

The general form of the cross section may be stated as follows: Seven hundred feet from the water's edge, it has become six feet deep, covering a perfectly regular inclination of the bottom; then in forty feet the waters deepen to twenty-three, giving seventeen feet increase of water, nearly one foot vertical to two horizontal, quite as steep as we could expect the bank would stand under water. From this point, for twenty feet, the water deepens but two feet, the next forty but two feet, the next sixty but five and a half, or nearly one foot in ten, the next sixty seven feet, or a little more than one in ten. Thus we have an abrupt bank until we get a depth of twenty-three feet, then a much more gradual slope until the level bottom is reached. Ten or fifteen feet of the bed of this lake, is marl, that has been precipitated from the water, and this marl lies on sand and clay with some strata of gravel.

Every boring that has been made within this basin gives this general result, the only variations being in the thickness of the several strata, not in their character. The well near the road that crosses the beach at the head of the lake, was intended to be in the middle of the valley. The tube was sunk 414 feet through the following strata:

White and beach sand.....	34 feet.
Blue clay.....	100 do
Light colored clay....	48 do
Sand, coarse enough for mortar.....	209 do
Clear gravel.....	6 do
Quicksand.....	11 do
Cemented gravel.....	2 do
Red clay.....	3 do
Red clay (hard).....	1 do

The bottom of this well is nearly fifty feet below the surface of the sea. At 134 feet, a cedar log was encountered in a state of perfect preservation.

This is not only a deep but an ancient valley. The fact of finding timber in this deposit, goes to show that a large part of the excavation has been filled since the general emergence from the sea, and that a large part of the alluvium has been taken by the present water courses into the valley. This timber, and the many other pieces encountered from time to time by the drills, was probably brought into the lake by some of its tributaries. However this may be, the marl and clay that lies above the timber found, has been deposited by the waters of the lake.

Mr. Spencer supposes that the fact, that it has now a level bottom, surrounded by steep banks of marl, clay, and sand, is only to be accounted for by a subsidence of a large part of the bottom, and that such subsidence is caused by the gradual dissolving of salt that lies under it.

It is certain that water holding in solution earthy matter, never deposits it in the form we now find the bottom of this lake.

Convenience has, thus far, caused all the drilling for salt water to be made around the lake, and the lesson taught by every experiment has been that there is no strong salt water to be found out of the alluvium in the valley, and the thicker the alluvium the better the prospect for strong water. The tube, 414 feet deep, was yielding the most valuable water, until it was, unfortunately, pushed down through the gravel to either a bed of clay or rock, by which means it was plugged up so that the salt water could not enter it.

The water used to drive the machinery for pumping, is taken from the canal, and it is not convenient to convey it great distances over the swampy grounds around the head of the lake. Experience has shown that pipes of wood, leading from the wells through which the water must be drawn, by producing a vacuum, cannot be used without being flooded with water. This flooding is accomplished by using fresh water, and thus the air leaks are stopped by allowing fresh water to run in, mingle with, and weaken the brine. This deep well is so far from the canal, that a pump driven by steam, would be necessary at the well to raise the water to a receiving reservoir, that should be high enough to allow the water to run to the force pump at the canal, and by thus flooding it, do away with the necessity of drawing the water there by suction. This well was sunk in 1851, and probably has not been recovered, as it may be by raising the tubing, as a sufficient supply of water has been accessible much nearer the pumps.

Mr. Spencer's theory that the bottom of the lake has gradually subsided by the dissolving of rock salt, can only be tested by boring in the lake far enough from the steep bank to get above the rock salt, if there be any.

By using the ice, a frame could easily be sunk, until it rested on the bottom of the lake, and then a tube could be carried down to any desired depth. The object is certainly worth the experiment.

Away from this basin the State has been to the expense of drilling six hundred feet, a great part of the way through rock, and the expenditure was not an entire loss, for it taught us that rock salt was not to be looked for in that direction.

It has been assumed by geologists that visited these salines before the deep well was sunk in 1851, that the floor of the valley would be found to be the Niagara limestone, that outcrops in Cicero, ten or eleven miles northeast from Syracuse. Careful levelings made for this report have resulted in showing that this rock should be met at about three hundred feet below the surface of the lake, but the drills have shown that it is not there. It was dug out with the Clinton group, and, perhaps, most of the Medina sandstone, when the valley was excavated. The Niagara limestone, so familiar to every visitor to the "Falls," where it is eighty-one feet thick, cannot be more than six or seven feet thick on the sides of the basin of Onondaga lake.

Personal examination of the quarries in Cicero demonstrated the looseness of the seams and stratification. It would yield readily to the action of a powerful current of water.

Mr. Vanuxem says (Superintendent's report, 1843, p. 34,) "the materials which fill this excavation, from all the borings and wells which have been made, show that they consist of sand, gravel, and other rolled stones, being chiefly round fragments of the dark colored limestone, which crops out about nine miles north of Syracuse, and which passes under the red shale, in which, at all the salines the excavation was made; also of the red sandstone which borders Lake Ontario; the gray sandstone which underlies the red; the same which forms the high falls of Salmon river in Oswego county, and likewise fragments of primary rock, either of Canada or the north-eastern part of New York."

The 414 feet well, goes down to the level of the Medina sandstone, which is a salt bearing rock, springs abounding in it, from the east side of Oswego county to Niagara river, from which salt has been made. In Hastings and Palermo, in Oswego county, salt springs are known, as well as at Sterling Center, and near Little Sodus bay.*

The water drawn from this well either came from the face or within this rock. The hopper forms of part of the gypseous rocks lying south and above the salt springs, has been assumed as sufficient evidence of this rock having supplied all the saline materials for this basin; the question now arises, may there not be some salt in the Medina sandstone, to which we are in part, at least, indebted for our strong water?

Prof. Hall ascribes the Medina sandstones, and the Onondaga salt group, to mud volcanos—"an overwhelming inundation of mud." He supposes that, in the broad expanse of a blue ocean, with its coral groves, among which lived the shells and crustaceous, and in sheltered nooks the crinoids reared their beautiful heads, "a huge mud volcano, charged with saline matter and corroding acids," suddenly bursts forth, destroys all these living things, and obliterates every vestige of their forms, leaving materials from which we, in these later ages, extract so much that enters into the enjoyment of life. Dr. Lewis C. Beck, in his *Mineralogy of New York*, published in 1842, reiterates an opinion previously expressed by him, "that of all the theories that have been proposed, to account for the formation of these springs, there is none so free from objection as that which ascribes it to the solution of beds of fossil salt." The arguments he uses to sustain his opinion, may be found at length in his work, and need not be repeated here. The question *how* the salt found its way into the basin of the lake is certainly one of interest; but how to find the strongest water, in the greatest abundance, is one of much more practical importance just now, looking forward, as we are, to the time when ten, fifteen or twenty millions of bushels of salt can find a yearly market.

The consumption of water in 1859, was not less than three hundred millions of gallons; and for the judicious manufacturing of salt, it should all

be evaporated in the two hundred and forty days of the eight warmest months. For the solar works, the average of good days for the season, is seventy.*

All that has been learned from the past attempts to find water, whether successful or unsuccessful, we call to our aid, and try to deduce the laws that govern.

They may be summed up as follows: Water, containing salt, is found by shallow digging on the shores of the lake, from the village of Liverpool, which is three miles from the wells in the first ward of the city of Syracuse, all the way round the head of the lake, and on its southwest side, to within less than two miles of its lower end, the whole distance being more than nine miles. So strongly is the soil impregnated, that in many places no timber will grow. Samphire (*Salicornia herbacea*), grows in patches many acres in extent. From these surface waters the first salt was made; then wells were dug as deep as they could be conveniently curbed with timber; then drills were resorted to, and pipes that would exclude surface water were pressed down, by which means stronger water was procured; then the tubes were sent down deeper, and still stronger water was found. Around the head of the lake, where there is a wide marsh extending to the hills, the new wells were dug, nearer and nearer the lake, the strength of the water increasing as the middle of the valley and the lake were approached, until a tube was sent down to a stratum of clean gravel, 397 feet below the surface, where brine of the best quality was found, and in great abundance. The quality suddenly fell off—owing, probably, to leaks in the line of suction logs that led for a great distance, and under a canal, to the pumps. The tubing was pressed down still farther to a hard red clay, 414 feet from the surface, where no water could enter the lower end.

All the borings show that the valley is filled with drift and sedimentary matter, and timber is found at various depths down to 134 feet. The salt water rises in all the tubes, to about the level of the lake, and is strongest when the lake is highest. Does the increased pressure of deep water, force the strong brine from its source outward, where the tubes reach it? The upper end of the lake is enveloped with salt water; the district is four and a half miles long, one and a half wide, and of yet unknown depth; why not put a tube in the center of the salt basin? †

MANNER OF DRILLING AND TUBING A WELL.

The tubes now used by the State for raising salt water, are eight inches caliber, made from sugar maple logs, in sections eight feet long, and turned

* Superintendent's Report, 1860, page 7.

† Since the foregoing was written, the report of the Superintendent for January, 1860, has appeared, and I am gratified to see a suggestion therein at page 10, that the "great strength of Onondaga brines, over any other not in immediate contact with fossil salt, is due to the depth of the rock excavation which forms the natural reservoir;" and the opinion is expressed that "if wells can be obtained at the depth of 500 feet, saturated water will be found." The Superintendent proposes to dig "a series of test wells to be carried across the salt basin from Salina (1st ward, Syracuse) to Geddes, to ascertain its depth and the character of the sedimentary deposits."

in a lathe, to the uniform thickness of three inches. These sections are cut off square at the ends, and a recess turned into the timber on the outside to receive a band of iron, ten inches wide, and one-fourth of an inch thick, which is to rest on, and confine the ends of two of these sections when they are joined together. A circular dowel of cast iron, three inches wide, is let into the ends of the sections, holding them together firmly, and excluding all water from the joints. In the first place, a cast iron tube, three feet in length, is joined to a wooden section. This piece of iron tubing is sharp at the lower end, having the inside enlarged for a few inches up, leaving the outer diameter fourteen inches, to correspond with that of the wood. These sections are set up perpendicularly, and by a press, forced into the soil.

When the tube has sunk down far enough for another section to be added, the press is withdrawn, the section put on, and again the press is applied. This process is continued as long as the tube can be sunk without removing the earth that is inside. When this point is reached, which sometimes is sixty or seventy feet from the surface, the drills are introduced, and by first cutting the earth fine, a bucket made of iron, with a valve at its lower end, will take hold of and lift the contents of the tube to the surface. When hard material is met, sharp drills are used to cut it up. The shape of the lower section, made of cast iron, is such that at the very end of the tube its caliber is nearly equal to the outer dimensions, and by using drills that have springs placed on one side of their stems, and edges that point outwards from the springs, holes may be cut through rock, that will be large enough to allow the tube to pass. Various tools are called into requisition to reach down and grasp substances, and to overcome the obstacles that are encountered, that would require drawings for their illustration. Descriptions will not be attempted. The press that is used, is simple,—heavy beams of timber supported by strong posts that are connected with a platform, through which the tube passes. This platform is loaded with stone, so that it will not lift, when the heavy iron screws that pass through the beams are turned down on the yoke that presses the tube. The rods to which the drills are attached, are made of iron, in sections of convenient length, connected by screws. These drills are lifted by ropes worked by a steam engine, and let fall by means of a simple device, cutting and breaking up whatever is in the way, by their weight.

This tubing costs, with the bands and dowels, seventy-five cents per lineal foot, and the whole cost of a well, aside from the use of tools, is from five to six dollars per foot.

A well once obtained, wooden tubes are connected, that lead to a pump which sucks up the water. The difficulties of having perfectly tight suction pipes, have been alluded to. The injury to the manufacturer, caused by flooding these pipes and thus drawing in fresh water at every leak, is one they should not suffer. Lifting pumps should be placed over the wells that would raise the water high enough to cause it to run of its own gravity, to the forcing pumps that elevate it sufficiently, to supply the manufac-

ries. Now, every stroke of the reciprocating double acting force and suction pumps, has to overcome the inertia of the whole column of water, from the bottom of the well to the distributing reservoir. This inertia is so great in long pipes, that the pumps produce a vacuum at every stroke, and thus there is an inward pressure of the atmosphere of fifteen pounds to the square inch that drives air, or when flooded, water, into every crevice and pore of the pipes. Lifting pumps at the wells moving slowly, with long strokes, would do away with much of the strain of the machinery, and remedy the present evil. When the wells are near the pump houses, shafting can be carried to them at trifling expense. Small steam engines can be used at the wells that are too far off to use shafting with economy.

THE WATER.

Mr. Spencer's letter contains Prof. Beck's analysis of these waters as they are pumped from the wells. A description of the various constituents has been given by Prof. Cook, in his report for the year 1853. The substance of his description, is as follows :

Common salt, muriate of soda, or according to the modern system of chemical nomenclature, *chloride of sodium*, contains 60.68 per cent of chlorine, and 39.32 of sodium. The specific gravity of salt, when solid and perfectly crystalized, is 2.165, which would give for a bushel (2150 inches,) 168 pounds. The salt of commerce weighs from 36 to 80, 85, and rarely 90 pounds.

Salt is a solid that melts at a bright red heat, and passes off without being decomposed. It is without odor, color white, or transparent. It crystalizes in cubes, from its solution in water, and when formed by rapid but quiet evaporation from the surface, it forms hopper-shaped crystals; hot and saturated solutions, when cooled, frequently give long, slender, square prisms; formed in hot solutions, agitated by boiling, the crystals are very small and broken into irregular shapes; when rosin, soap, butter or any oily substance is added to brine, it will not form crystals, but by evaporation, deposit the salt in exceedingly fine grains.

Salt usually attracts moisture from the air, *but when pure, this attraction is very slight.*

Chloride of calcium, formerly called *muriate of lime*, is a compound of chlorine and calcium, containing 63.35 per cent of the former, and 36.65 of the latter. It is acrid, very sharp and bitter to the taste, and when exposed to the air attracts moisture rapidly.

Chloride of magnesium, formerly called *muriate of magnesia*, is a compound of chlorine and magnesium, containing 73.64 per cent of the former, and 26.36 of the latter.

If heated strongly it decomposes; muriatic acid escaping and magnesia remaining. This decomposition often happens in the boiling process. When the brine in the kettles is diminished by boiling, a portion of the surface of the iron is exposed to the direct action of the fire, and becomes very hot. Any chloride of magnesium that may be in the scale on the inside of

the kettle above the brine is thus decomposed, the magnesia remaining in the salt.

The chloride of magnesium is extremely bitter; it absorbs moisture from the air rapidly, and imparts the same quality to salt. This quality has given to the chlorides of calcium and magnesium the name of *deliquescent chlorides*.

Sulphate of lime, called gypsum, and plaster, is a compound of sulphuric acid and lime, and contains a definite portion of water. It consists of 46.51 per cent of sulphuric acid, 32.56 of lime, and 20.93 of water. Its specific gravity is 2.322. When dry it dissolves in about 500 parts of cold, and in 450 of boiling water.

Oxide of iron is a compound of oxygen and iron. It is a red, tasteless insoluble substance, and apparently inert in its properties. When the brine is first pumped up, it is not perceptible, being combined with carbonic acid and dissolved. On being exposed to the air the carbonic acid escapes and the oxide is precipitated. Its precipitation is hastened by putting into the brine quick lime, alum, or common clay.

The process of manufacturing, consists in removing the water by evaporation, and at the same time getting rid of all the impurities held in solution. In the boiled salt this is accomplished, by first precipitating the oxide of iron in the cisterns connected with the works. Unless this oxide is removed, the salt will have a reddish color. The alum used for its precipitation improves the grain of the salt, making it firmer and causing it to drain well.

The sulphate of lime is precipitated as the point of saturation is approached, by pans placed on the bottoms of the kettles, into which as it falls it is lifted out during the boiling of the water. The *bitterings*, as they are called, that are thus removed are almost pure gypsum. "In boiling salt, the slow processes of nature are interfered with. The heat is so high that the precipitation of the sulphate of lime is rapid, and constant care in *panning* is necessary, or the kettles will soon be 'blocked' with a crust of impurities three or four inches in thickness. This scale has to be removed every few days by mechanical means. The more soluble impurities also cannot be so well separated by the simple drainage to which this kind of salt is subjected."*

After the salt commences forming, the panning ceases, and the water is boiled down to fifteen or twenty gallons, when the salt is removed and placed in a basket, on supports, over one side of the kettle, where it drains, until another kettle full has been made, when it is emptied into the bins, where the law requires it should remain at least fourteen days to drain before it is packed. Perfect draining is essential for salt used in curing meat, for its power to absorb the moisture from the meat must depend greatly upon the dryness of the salt. As the moisture of the meat is given off, the salt is absorbed, and enters into its substance; or, to use the common expression, "strikes in." To secure this striking in quickly, dry fine

salt, whether made in kettles or in solar vats, will be found successful, if it is only pure.

SOLAR SALT.

This is the name given to salt that is made without the use of artificial heat. The structures for its manufacture consist of long parallel rows of shallow wooden vats, sixteen or eighteen feet wide, supported by many small posts. These rows of vats are divided into what are called deep rooms, lime rooms, and salt rooms. They are arranged in various ways, as the shape of the ground, or the fancy of owners may dictate. We have selected for our description the works of the "Salt Springs Solar Salt Company." The water is drawn directly from the distributing reservoir into the deep rooms, which are about a quarter of a mile long. The water runs the whole length of a "string," and then is carried into the next parallel string by wooden pipes. It runs the whole length of this string back to opposite the place where it was first introduced; then again it is sent into another, and another of these strings, and having thus been exposed to the sun and wind, in a sheet perhaps ten inches deep, and sixteen feet wide, for a whole mile, it has rid itself of the oxide of iron, has increased in strength from 70° to 84° of the salometer, and is ready to be carried into the lime rooms, where it deposits the sulphate of lime. It is kept running along these rooms, in a thinner sheet, until the small cubes of salt are seen forming. Saturation is now complete, and all the impurities have been precipitated, that can be. The water thus concentrated, and freed from the lime and iron, is drawn into the salting rooms, where pure salt is rapidly deposited, having a coarse crystalization, in the form of hoppers and cubes. There yet remain in the brine, after the salt is removed, impurities more soluble than the salt, viz: the deliquescent chlorides. About one-third of all the vats are required for precipitating the impurities. The whole "field" is expected to yield fifty bushels to every cover of sixteen by eighteen feet. The word cover is derived from the movable roofs, or "covers," that in fair weather are shoved off, on ways, to allow the sun to reach the water. These covers have been adopted as the standard of measure; and, in speaking of a salt field, it is said to have so many covers. Space is required for the covers when off the vats, and also for roads between the strings, to cart away the salt. An acre of land requires sixty covers, costing about \$30 each; thus the cost is about \$1,800 an acre, which will yield 3,000 bushels of salt in an ordinary season. The cost and space required are disadvantages that are fully met, by the cheapness of the manufacture when once the works are in operation. From four to five cents per bushel is paid for doing all the work involved, even to the shipping of the salt.

In making this solar salt, Nature's process is imitated exactly; and close watching of the changes of the weather, and cleanliness, is all that is necessary, with ordinary care, in transferring the brine to the different vats, and in the draining, to make the purest salt known. Formerly this salt was kiln-dried, and ground in common flouring mills for dairy pur-

poses, at considerable expense; but recently a very simple mill has been invented, that grinds it without any drying by fire. Well drained in the store-house, it is put through the mills, and ground to any desirable fineness, for butter or table use, at a cost of not over one cent a bushel.

The coarse solar salt is in demand for packing provisions, as experience and abundant tests have shown its value. Now that it can be ground for so small a sum, it will be used for rubbing meat and for all packing except to "cap" the casks, which requires larger particles, that by dissolving slowly, will supply the waste from the brine, caused by the absorption of salt by the meat.

Solar salt can only be made in hot weather, and therefore the amount must be limited by the daily supply of water from the wells, unless reservoirs are constructed to accumulate water during the winter season. One earth reservoir has been constructed by the present Superintendent, Mr. Smith, that will hold water sufficient for six hundred thousand bushels of salt. More storage of this kind will soon be required.

Prejudices have existed in regard to the value of our salt, which though fast passing away, still occasionally appear.

Every little while our Agricultural Society gives some one's report of his, or her, process of making butter, with the assertion that Liverpool, England, must furnish the salt. Time will remove these prejudices, as it has those that once existed against English salt. Space cannot be spared to reproduce the proofs that again and again have been given to the public in print, that Onondaga salt is as good as any in the world. It is perhaps sufficient to say that there is nothing new in our case.

"Many of the fishermen on our coast imagine that salt made on the Mediterranean coast of France, is better than any other for curing fish, and it is imported largely for that purpose." The French fishermen complained of this very salt, alleging that, that which was made on the Atlantic coast of France and Portugal, was the only kind that could be depended upon.

The French government appointed a commission, as ours of this State has often done, to decide the matter. They reported that the one salt was as good as the other, only the Mediterranean salt is freer from dirt, and a little less deliquescent. At the manufacture of Dieuze, *they put clay into the brine, until the color, required by the prejudices of their customers, is procured.**

Prof. Emmons, some years since, at the request of the Secretary of the New York Agricultural Society, went into the market in Albany, and procured several parcels of Onondaga salt, made by different manufacturers, and subjected them to analysis.

The result was, he found, in one case, 92.980 parts of pure salt, in 95.019 parts of the sample. In another, 97.466 in 99.415; in another, 95.819 in 98.899; in another 95.113 in 97.135; and in another 98.886 in 99.900.

These samples were from boiled and solar salt. He says, "It is evident from the foregoing analysis, that the salt of Salina contains no substance

injurious to dairying purposes. The only source of danger is, that the salt may be damp. Wet salt is entirely unsuitable for preserving animal substances, inasmuch as the principal operation of salt, as a preserver, is due to its power of absorbing water from the material to be preserved; hence salt should be always dried."

The impurities of the salt of Onondaga are not *directly* injurious, but they are not salt, and when weighed as such, they deduct so much from its value, and thus more of the impure salt is required to cure meat.

Perfectly dried, and in sufficient quantities, Onondaga salt never fails to cure meat, if the process of packing is properly conducted.

In closing this account of the salines of Onondaga county, and their products, it is proper to say that many persons have supposed there was great loss of heat in the arches, and much money has been expended in trying to find some method for evaporating more water with a cord of wood or ton of coal. Thus far, little or no progress has been made in this direction, for the very good reason that there is really less room for improvement than a stranger is apt to suppose.

Prof. Cook made extensive investigations to determine the quantity of water evaporated with a given quantity of fuel, at Liverpool, England, Dieuze and Rotterdam, and found that Onondaga salt works were as economical as any known. More than fifty bushels of salt are made from a cord of wood; Mr. Spencer has made in his works fifty-eight. Unless more than eight pounds of water can be evaporated with a pound of coal, by any proposed apparatus, it is not worth while to invest money in constructing salt works, with the expectation of making more salt than is now made, for the same cost.

These remarks appear called for, to warn those gentlemen who nearly every year come here to invest capital in improvements. Not that improvements cannot be made, but we start with the knowledge that at least eight pounds of water are now evaporated with a pound of coal in a common salt block.

CHAPTER IV.

SOILS OF ONONDAGA.

Soils are usually classified from the predominance of sand or clay, and are called sandy or clayey, as either of these substances predominate. Where sand and clay are mixed with organic matter, the whole is called *loam*. If sand predominates in this mixture, it is usual to call the soil a sandy loam; if clay, then a clayey loam. These are the general terms applied by farmers to soils, and many farms will be found to have all these varieties; and if we know the rocks from which the sand and clay were derived, these general terms will, when applied to a particular farm, serve to give quite a definite idea of its value.

Using then the terms, sandy, clayey, and sandy and clayey loams, as applicable to this county, a proper classification would be as follows: The

soils north of the Erie canal are uneven, sand abounding in large districts, while in others clay is in excess; while in still larger areas they are mixed in the proportions that are best for keeping the soil from being too tenacious by excess of clay, or too loose by excess of sand. Loamy soils abound in all the north half of the county, most of the materials being drift.

A belt, lying along the south side of the Erie canal, and extending south to the Marcellus Shales, has less of drift, and the soil is more directly due to the decomposition of the underlying rocks of the Salt group and the Helderberg range. These soils come under the name of clayey loams. The rest of the county, to the south, is divided by valleys and ranges of hills, whose general course is north and south. The valleys are covered with drift and alluvium, while the hills have soils that are principally made from the decomposition of the shales that underlie them, constituting a soil that would best be classed as a loam.

The drift of the northern part of this county is derived from the rocks that outcrop here, and from those that are to be seen still further to the north. The Medina sandstone contributes largely, and we find a very considerable proportion of granitic rocks in the soil. The decomposing felspar and mica of the granite, gives alkalis to the soil, which are so combined with silica that they are comparatively unaffected by the water, and are not carried off by it, but are retained in the soil for the use of plants. (Emmons.)

The lime of the Helderberg range, constitutes the principal part of the drift of the southern valleys, and therefore wheat is produced in them with profit. The late David Thomas, in a letter to Dr. Emmons, says: "Generally it is good wheat land as far south as the detritus from our limestone formations has been *abundantly* spread. The current that swept over this country took a southerly direction, and wherever the slate rocks were exposed to its action, a portion of them is mixed with the soil; thus, near such localities, the soil is less calcareous and less favorable to wheat. The drift from our rocks grows less and less as we go south, and as it grows scarcer, the fragments have become more worn and rounded in their progress, giving a less and less proportion of the diluvial formation. About twenty miles south of the Pennsylvania line, every trace of our rocks disappears. The people residing on the Susquehanna, used to supply themselves with lime by gathering and burning small fragments of rounded stone from the shores, much of it not larger than gravel, and which doubtless were swept from this district."

Of the formation of soils, Dr. Emmons says: "The composition, liability to solution, the structure and position of rocks, have an important bearing on the discussion of the formation of soils. Each of the groups respectively impart to the overlying soils, some of their distinguishing characteristics, and in a good measure make them what they are. Transporting agents modify them by intermingling soils that have originated from rocks that are to be found at a distance. *Unless the beds of drift*

are deep, it will be found that the underlying rocks give a stronger character to the soft materials than is usually supposed. Limestones are liable to a constant loss of material by the solvent properties of rain water, which holds carbonic acid in solution. This is favored by rough and uneven surfaces on which water will stand. Polished surfaces are acted on but little. The shales and slates disintegrate rapidly—water and frost are the agents.” Of the wearing down of *silicious limestones*, or *calcareous sandstones*, he says: “The lime dissolves out, leaving the sand on the surface, which falls off and leaves a new surface, from which the lime is dissolved, and the sand falls. The dissolved lime, however, does not all pass into and remain in the soil, but is carried down and forms, very frequently with other materials, a *hard pan* or pudding stone, or concretions, the lime acting as a cement. In other instances it percolates into and through the rock and forms stalactites, veins, or other deposits. Lime is removed from the soil in the same manner that it is from the rocks. Thus this element is removed by vegetation and the ordinary action of rain water.”

These extracts, with what else has been said as to the formation of soils, it is judged will be sufficient for a general description of our soils. The composition of the rocks from which they are formed being given elsewhere, it is thought that a careful study of their constituents, with some discrimination on the part of our practical farmers, with reference to drift and alluvial formations, will enable them to know, with sufficient certainty, what their lands are composed of, without special analysis.

FOREST TREES.

A great variety of forest trees were indigenous in Onondaga county. The forests here were originally dense, and the timber generally heavy. Large forests of white pine, *PINUS strobus*, grew in the north part of the county, and smaller areas of this valuable timber were found along the base of the Helderberg range, and a few scattering trees grew even above the corniferous limestone. There were some valuable pines in the swamps of the southern towns, but not enough to supply their demand. Along the south line of the Gypseous Shales, were some trees of uncommon dimensions. Near the northeast corner of the town of Camillus, one was cut down that measured 230 feet as it lay on the ground; another near this, gave 154 feet of saw logs. They grew on land now owned by Wheeler Truesdell.

White cedar, *CUPRESSUS thuyoides*, abounded in the swamps north of the Helderberg range, and in small quantities among the pines in the southern swamps. This timber has furnished the materials for a large part of the rail fences in this county.

Hemlock, *PINUS canadensis*, was very plenty in almost every part of the county, but was most abundant in the northern half. This valuable timber has been used extensively for building, fencing, and making plank roads. Two varieties of spruce, *PINUS nigra*, and *PINUS alba*, are found in the swamps, but not in size sufficient to make it of any great value.

Tamarack, *PINUS pendula*, is found in the same locality with the spruce.

Red cedar, *JUNIPERUS virginiana*, of which but few specimens can now be found growing, was formerly procured in small quantities around the head of Skaneateles lake, and used principally about the village of Skaneateles for fence posts.

White oak, *QUERCUS alba*, grows in abundance on the limestone soils. The gypseous shales were generally covered with a stunted growth of white oak, for the whole width of the county, east and west. The town of Otiseo had large forests of this valuable timber, some parts of which yet remain.

Some very large oaks were found on the low lands north of the Erie canal, and scattered among the scrub oaks of the gypseous shales. One of them, at Fairmount, was saved when the other timber was cut away, as a monument; but, deprived of its surroundings, it soon died, and of necessity was cut down. The stump was five feet in diameter, and forty feet above, where it was somewhat elliptical in form; its two diameters measured, the one four feet and six inches, the other three feet and ten inches. A block cut from this tree is still in existence.

Black oak, *QUERCUS tinctoria*, and some other varieties, were also found in this county. Two species of hickory, *CARYA alba*, and *CARYA tomentosa*, grew in abundance on the lime rocks with the oaks. Red elm, *ULMUS fulva*, and iron wood, *OSTRYA virginica*, are found on the same soils; while the wet lands abound in the swamp white elm, *ULMUS americana*, black ash, *FRAXIMAS sambucifolia*; black birch, *BETULA lenta*; swamp white oak, *QUERCUS bicolor*; and the sycamore, *PLATANUS occidentalis*.

The tulip tree or white wood, *LIRIODENDRON Tulipifera*; the basswood, *SILIA americana*; sugar maple, *ACER saccharinum*; beech, *FAGUS ferruginea*; white ash, *FRAXIMUS americana*; the cherry, *CERASUS serotina*; and the chestnut, *CASTANEA vesca*, abound on the lime rocks, and on the hills of the south part of the county.

There were many other kinds of timber found in the county, but the most important have been given. The progress of improvement has swept away these once noble forests, so that not enough now remain to meet the demand for fuel.

Already the coal mines of Pennsylvania are largely drawn upon, not only by the manufacturers of salt, and the inhabitants of the city of Syracuse, and the surrounding villages, but also by the farmers. Timber and lumber for building purposes can no longer be had in any considerable quantities of our own growth, and large importations of pine lumber are made to us from the shores of the rivers that empty into Saginaw bay. Oak is also brought from the western lakes.

From the first settlement of the county, the "oak lands," as they are called by the farmers, have been proverbial for their ability to produce wheat; and that belt of land, once covered with oak and hickory, is the

true wheat land, while the beech and maple lands are best adapted to grazing, and the pine lands are generally well suited to both grain and grass.

Dr. Emmons has analysed the ash of many specimens of forest trees, and gives, as the results for the sap wood, heart wood, outside bark, and inside bark, in separate columns. His investigations are interesting, but would take too much room in this place, and will be used only to show the per centage of potash and lime, that he found in the outside wood of some of the kinds of timber, growing in the three divisions of the county, viz: the northern, central, and southern.

			Potash.	Lime.
Northern division	represented by	swamp white oak,....	20.49	52.26
	do	do		
		elm,	15.85	20.08
Middle	do	do		
		upland white oak,....	13.41	30.85
	do	do		
		hickory,	7.47	38.26
Southern	do	do		
		beech,	12.13	31.56
	do	do		
		sugar maple,....	8.77	49.33
	do	do		
		basswood,	10.12	41.92

The swamp white oak and the elm abound in potash, while the upland white oak and hickory have much less. The beech, maple and basswood, average but little more than ten per cent of potash. The elm has only twenty per cent of lime, while the swamp oak has over fifty-two. The low lands abound in potash and lime, but in the uplands there is much less potash.

LIST OF WEEDS troublesome to the Agriculturist in Onondaga.

Prepared by W. M. BEAUCHAMP, Esq., of Skaneateles.

NAME.	Where found.	Time of flowering.	Duration.	Stem.	Leaves.	Flowers.
RANUNCULACEÆ.						
Crow's foot (hairy) <i>a</i>	Wet grounds.....	June, Aug.	Perennial	Eighteen inches high; hairy	Three cleft or three parted.....	Resembles the buttercup.
Buttercup <i>b</i>	Meadows.....	May, Aug.	do	Twelve in. high; erect; hairy	Three cleft or three parted.....	Deep, shining yellow.
Marsh marigold <i>c</i>	Road-sides.....	April, May	do	6 to 12 in. high; erect; branched	Large and shining.....	Few an inch or more in diam; bright yellow
American globe flower.....	Wet grounds.....	May, July	do	Twelve inches or more.....	Hand-shaped.....	Large; yellowish; terminal.
CHELIDONIUM.						
Commoncelandine <i>d</i>	Floods, waste places.....	May, Oct.	do	One to two feet; branched.....	Imperfectly arranged.....	Yellow; capsule an inch long; narrow.
PAPAVER.						
Field poppy <i>e</i>	Cultivated grounds.....	May.....	Annual.....	One to two feet high.....	Hand-shaped; segments lance-shaped.....	Pale red; on long flexuous peduncles.
CAPSELLA.						
Common Shepherd's purse.....	do.....	April, Oct.	do	One to two feet.....	Pinnatifid; hairy.....	Small; white.
SINAPIS NIGRA.						
Black mustard <i>f</i>	Fields.....	June, July	do	Two to four feet.....	Lower leaves lyrate; upper lanceolate.....	Yellow; pods smooth.
CHARBOL.						
Wild mustard <i>g</i>	Meadows and cultivated grounds.....	June, Aug.	do	Two to three feet; rough.....	Lyrate pinnatifid; rough.....	Large; bright yellow; seed pods smooth.
STELLARIA.						
Stickwort.....	Road-sides; fields.....	Mar., Nov.	do	Much branched and somewhat succulent.....	Ovate and smooth.....	White.
ONOCLEA.						
Common chickweed <i>h</i>	Cultivated grounds.....	June, Oct.	Perennial	Ten to eighteen inches.....	Roundish cordate.....	Small; pink; two and three together.
LOW MALLOW.						
<i>i</i>	Fields; pastures.....	June, Sept.	do	Six in. to two feet; shrubby	Ovate lanceolate.....	Pale orange.
IMPATIENS.						
Jewelweed, balsam.....	Wet lands.....	Aug. Sept.	Annual.....	Two to four feet.....	On petioles an inch or more long.....	Large, deep orange; reddish brown spots.
ERIGONUM.						
Willow herb <i>k</i>	Damp ground.....	August.....	do	Three to five feet.....	Obtuse; on petioles half an inch long.....	Larger than the last; gamboge yellow.
POSTELACA.						
Common purslane <i>l</i>	Wet, low lands.....	July, Sept.	Perennial	One to three feet.....	Lanceolate.....	Flowers at the apex of a long pod; pale purple.
SCLERANTHUS.						
Knawel.....	Gardens and cultivated fields.....	May, Aug.	Annual.....	Fleshy and spreading.....	Wedge-shaped; obtuse.....	In clusters; pale yellow.
SEDUM.						
Stone crop.....	Sandy fields.....	July.....	do	Numerous; branched, forming tufts 3 to 6 in. in diameter	Aw-shaped	Small; green, in leafy clusters.
	Rocks and fields.....	July.....	Perennial	One to two feet high.....	Broad.....	Purple.

a. There are many varieties of Crowfoot, but the hairy is most common here. *c*. Root coarse; knobby fibres.
b. This plant is from Europe, and full of orange juice. *d*. Introduced from Europe. *e*. A very troublesome weed; introduced from Europe.
f. This plant is too well known; it is from Europe. *g*. There are several varieties troublesome in some localities.
h. There are many varieties of this plant, and, like John's wort, often troublesome. *i*. Spreads rapidly, and is very troublesome.

LIST OF WEEDS troublesome to the Agriculturist in Onondaga.—(Continued.)

NAME.	Where found.	Time of flowering.	Duration.	Stem.	Leaves.	Flowers.
<i>CICUTA</i> .						
Cowbane <i>a</i>	Wet grounds.....	July, Aug.	do	Four to six feet high; smooth	Heart-shaped, with the point downwards	White petals, heart-shaped, with the point downwards.
<i>CHENOP.</i>						
Poison henlock <i>b</i>	Road-sides; fences.....	July.....	Biennial..	Two to four feet.....	Smooth and shining.....	White; numerous.
<i>D. MACR.</i>						
Wild tansy <i>c</i>	Fields; waste places.....	July.....	do	Three to five feet; strong and prickly.....	Opposite on the stalk.....	Blue, in dense oval heads.
<i>EGYPTORUM.</i>						
Hemp weed <i>d</i>	Swamp; low lands.....	July, Oct.	Perennial..	Two to five feet.....	Lanceolate.....	Mostly white.
<i>Boucaet e</i>	Swampy.....	Aug., Sept.	do	Two to four feet; branched at the top.....	Large; lanceolate; oblong.....	White.
<i>SOLIDAGA.</i>						
Golden rod.....	Fields; woods.....	July, Oct.	do	One to seven feet.....	Lanceolate.....	Blue, purple, white.
<i>Asters f</i>	Mostly moist soils.....	July, Nov.	do	Six inches to six feet.....	Mostly lanceolate.....	
<i>AMBROSIA.</i>						
Rag weed <i>g</i>	Fields; road-sides.....	July, Oct.	Annual....	One to four feet.....	Pinnatifid; rough.....	[cone.
Hog weed <i>h</i>	Old fields.....	Aug., Sept.	do	One to four feet; rough.....	Rough; hairy underneath.....	Rays bright yellow; disk greenish; yellow.
<i>RUBRICKIA.</i>						
Cone flower <i>i</i>	Borders of swamps.....	July, Sept.	do	Four to six feet.....	Hairy; pinnate.....	[yellow.
<i>BIDENS</i>						
Swamp beggar sticks <i>j</i>	Ponds and ditches.....	Aug., Sept.	do	Six inches to two feet.....	Lanceolate; toothed.....	Rays yellow.
Spanish needles.....	Cultivated grounds.....	July, Sept.	do	Two to four feet; branched.....	Segments; lanceolate.....	Rays 3 to 4; small yellow; obovate disk
<i>MARUTA.</i>						
Common Mary weed <i>k</i>	Road-sides.....	June, Oct.	do	One foot; erect; branched.....	Pale green; segments narrow.....	Rays 12; white disk; convex yellow.
<i>LEUCANTHEMUM.</i>						
Ox-eye daisy <i>l</i>	Fields; road-sides.....	June, Aug.	Perennial..	One to two feet; erect.....	Often pinnatifid; toothed near the base.....	Head large; solitary on the branches; rays 20 to 30; white disk; flowers numerous;
<i>GNAPHALIUM.</i>						
Decurren. cud weed <i>m</i>	Fields and hills.....	Aug., Sept.	do	Two feet.....	Long, narrow, roughish and green above; white and woolly beneath.....	Heads on the stalk, in large roundish heads; scales white, or yellowish white.
<i>ANTENNARIA.</i>						
Pearly everlasting.....	Woods and fields.....	Aug., Sept.	do	One to two feet, covered with thick wool.....	Linear; lanceolate.....	Pearly whitish yellow.
<i>SENECIO.</i>						
Groundsel <i>n</i>	Gardens.....	May, Oct.	Annual....	One foot.....	Deeply pinnatifid.....	Yellow.
<i>ONOPORD.</i>						
Scotch thistle <i>o</i>	Meadows and cultivated lands.....	July.....	Biennial..	Four to six ft. high; branched and winged at the summit.....	Oxate; long spinous.....	Purple.
<i>CISTRUM.</i>						
Common thistle <i>p</i>	Fields; road-sides.....	July, Aug.	Perennial..	Two to four feet high.....	Deer's foot; hispid above, woolly below.....	Purple.
<i>Canada thistle q</i>	do	July.....	do	Two to three feet high.....	Very thorny.....	Purple; rarely whitish.
<i>LAPPA.</i>						
Burdock <i>r</i>	Waste grounds.....	July, Oct.	do	Three to four feet.....	Large; wavy in the margin; often two feet long; one foot wide.....	Purple.

	Woods ; meadows ; July, Sept.	Biennial.	Two to eight feet	Sub-clasping ; runcinate ; pinnatifid ; lanceolate ; acute ; runcinate ; toothed.	Yellow. Yellow.
<i>Lactuca</i>					
<i>Wild lettuce</i>	Woods ; meadows ; July, Sept.	Biennial.	Two to eight feet	Sub-clasping ; runcinate ; pinnatifid ; lanceolate ; acute ; runcinate ; toothed.	Yellow. Yellow.
<i>NARARACUM</i>					
<i>Dandelion</i>	Pastures and arble April, Nov.	Perennial	Two to four feet ; hollow	Two to six inches ; divided variously.	Pale yellow.
<i>Sorrels.</i>					
<i>Lowella</i>	Waste grounds.	July, Sept. Annual	Two to four feet ; hollow	Two to six inches ; divided variously.	Pale yellow.
<i>Indian tobacco</i>	Fields ; woods.	July, Sept. Biennial.	Twelve to eighteen inches.	Oblong ; lanceolate ; hairy.	Numerous ; pale blue.
<i>Cardinal flower</i>	Wet lands.	July, Aug. Perennial.	Two to three feet.	Oblong ; lanceolate.	Large ; bright scarlet ; 8 to 10 in. raceme.
<i>ACLETHAS.</i>					
<i>Milkweed</i>	Fields ; roadsides ; July, Aug.	do	Two to four feet.	Oblong ; lanceolate ; four to eight in. long	Large ; pale purple.
<i>CONVOLVULUS.</i>					
<i>Corn bindweed</i>	Fields.	July, Aug.	Two to three feet high.	Arrow-shaped.	White ; an inch long.
<i>Great bindweed</i>	Moist grounds.	June, July	Three to twelve feet high.	Very acute ; arrow-shaped.	White ; very large.
<i>Upright bindweed</i>	Sandy soils.	June.	Eight to eighteen inches.	Oval or oblong.	White.
<i>SYMPHYTUM.</i>					
<i>Common comfrey</i>	Spongy lands.	June	One to three feet high.	Radical ; leaves on long petioles ; rough.	Yellowish white.
<i>MYOSOTIS.</i>					
<i>Marsh scorpion grass</i>	Wet places.	May, Sept. Biennial.	Twelve to eighteen inches.	Linear ; oblong ; obtuse.	Small ; bright blue.
<i>Field scorpion grass</i>	do	May, June Annual.	Four to ten inches.	Oblong ; obtuse.	Small ; white.
<i>ECHINOPERIS.</i>					
<i>Slick reed</i>	Road-sides	July, Aug.	One foot.	Linear ; lanceolate.	Mute ; blue.
<i>Hounds tongue</i>	do	June, July Biennial.	One to two feet.	Lanceolate ; oblong.	Purplish red.
<i>Solanum</i>					
<i>Bittersweet</i>	Low grounds.	July, Aug. Shrubby.	Six to eight feet.	Oval and heart-shaped.	Purple, with two green tubercles.
<i>Common nightshade</i>	Old fields.	July, Aug. Annual.	One to two feet ; much branch'd	Ovate ; obtusely toothed, and wavy.	White ; nodding ; three to six in an umbel.
<i>VERBASCUM.</i>					
<i>Common mullein</i>	Road-sides, &c.	June	Three to six feet ; angular.	6 to 12 in. long ; ovate ; oblong ; downy.	Yellow, in a long dense cylindrical spike.
<i>LANARIA.</i>					
<i>Snop dragon.</i>	Road sides ; fields	June, Oct. Perennial	One to two feet high, with spreading branches.	Linear ; lanceolate.	Large ; yellow.
<i>MINTHA.</i>					
<i>Peppermint</i>	Marshy, wet lands	July	Twelve to fifteen in. ; branched	Round at the base.	Pale purple ; in spikes.
<i>Spearmint</i>	do	July, Aug.	One foot ; branched	Ovate ; lanceolate.	In rings around the stem ; pale purple.
<i>NERGTA.</i>					
<i>Catmint, or catnip</i>	Old fields ; cultivated lands.	June, Aug.	Two to four ft. ; several from one root ; downy and whitish	Oblong ; heart-shaped.	Yellowish white, tinged and spotted with red
<i>PLANTAGO</i>					
<i>Common plantain</i>	Fields, &c.	June, Aug.	No stem, but spiral seed ; shoots 2 to 12 inches long	Spreading on the ground ; coarsely toothed	Whitish.

a. Poisonous and medicinal. *b.* Poisonous and medicinal ; fetid when bruised. *c.* The radish shaped roots run deep. *d.* Medicinal ; bitter taste ; used as a tonic. *e.* Hit ter, used as a tonic. *f.* This family is large and troublesome. *g.* All the rag weeds are nuisances. *h.* Very acrid ; troublesome. *i.* Quiet and easy to rear. *j.* Troublesome to rear, used as a tonic. *k.* Plant frigid. *l.* Troublesome in pastures. *m.* Many varieties. *n.* Troublesome ; seeds below ground ; origin ; foreign ; origin ; downy ; seeds spread fast. *p.* Same as Scotch thistle. *q.* Increases by roots ; run deep and in long way ; foreign ; origin ; downy ; seeds spread fast. *r.* Same as Scotch thistle. *s.* Burs are nuisances to sheep. *t.* Prolific in seed. *u.* Roots thick often sending several scapes from one ; seed downy ; increases rapidly. *v.* Foreign ; seeds white and silky. *w.* Plant acrid ; powerfully medicinal. *x.* One of the most splendid flowers in the Northern States. *y.* Many varieties ; all troublesome ; increase by root, as well as seed. *z.* Troublesome ; deep and spreading roots ; climbing plant ; hairy. *aa.* Climbing and trailing plant ; nearly smooth. *ab.* Troublesome ; increases by root ; medicinal plant. *ac.* Troublesome to sheep, from the small burr that both these plants bear. *ad.* Troublesome. *ae.* Fruit rough ; troublesome. *af.* Foreign ; bright red berries. *ag.* Berry black ; poisonous ; foreign ; *ah.* Both rather troublesome. *ai.* There are several plantains ; some of them very troublesome.

LIST OF WEEDS troublesome to the Agriculturist in Onondaga.—(Continued.)

NAME.	Where found.	Time of flowering	Duration.	Stem.	Leaves	Flowers.
PHYTOLACCA.						
Common pokeweed a.....	Borders of fields..	June, Aug.	do	Four to eight feet high; succulent; purplish.....	Ovate; lanceolate; acute at each end.....	Flowers white; berries purple, in grape-like bunches.
POLYGONUM.						
Slender knotweed.....	Dry lands	July, Aug.	Annual...	Six to twelve inches.....	Lance; linear; erect.....	Small; white; in pairs.
Pennsylvanian knotweed.....	Ponds and ditches.....	July, Sept.	do	Two to four ft. br'ch'd above.....	Lanceolate; often hairy.....	Large; reddish; in numerous crowded spikes
Black bindweed	Cultivated lands ..	July, Sept.	do	Three to six ft high; climb'g.....	Oblong halberf; heart-shaped.....	Whitish, or reddish.
Buckwheat b.....	do	June	do	Two to three feet high; pubescent at the joints.....	Leaves acute.....	White, tinged with green and purple.
RUMEX.						
Yellow rooted dock.....	Swamps; damp grounds.....	June, July	Perennial	Two to four feet.....	Broad; lanceolate; flat; smooth.....	In a compound terminal panicle.
Urtica.....	Waste places.....	July, Aug.	.....	Two to four feet high; erect; simple or branching, clothed with stinging hairs.....	Ovate; heart-shaped.....	Small; green.
BOEMERIA.						
False nettle	Wet grounds	June, Aug.	.....	Two to three feet high; erect; four angled.....	Opposite; ovate; oblong; toothed	Minute; greenish.

b. Remains a weed after cultivation.

a. Poisonous.

CLIMATE.

The climate of a country is to be determined, by its latitude and elevation, modified in some degree by the configuration of the surface, proximity to bodies of water, nature of the soil, and extent of cultivation of its own surface, and the country around it. All these conditions influence our climate in some degree.

At mid-ocean, between the latitudes 30° and 50° , Mr. Kirwan found that the temperature diminished about nine-tenths of a degree of the thermometer for every degree of latitude. This may be taken, then, as the exact measure of the influence of latitude. The effect of elevation, Mr. Coffin makes equal to one degree of the thermometer for every 350 feet, but other observers have given 300 feet to a degree. Pompey Hill is 1743 feet above tide, Onondaga Academy 400, the difference in elevation is 1343 feet. The observed average temperature at Pompey Academy for seventeen years is forty-two deg. eighty-four hundredths; of Onondaga, for sixteen years is forty-seven deg. eighteen hundredths; the difference four deg. thirty-four hundredths, gives a degree of the thermometer for every $309\frac{1}{2}$ feet.

In Mr. Coffin's tables, he was troubled with Pompey as being too cold for its latitude and elevation. The difficulty grew out of his taking the elevation to be 1300 feet instead of 1743. This error being corrected, Pompey is no longer an exception to the rule he applies.

The influence of elevation on the temperature was illustrated on the 15th day of September, 1859. The extreme cold killed everything growing on the hilly part of the county. Personal observation in the towns of Otisco, Tully, Fabius and Pompey, proved that the injury was frightful. Descending the hills towards evening to the town of De Witt, it was found that the leaves of unharvested tobacco showed slight injury, which grew less and less as the elevation diminished.

Below the Helderberg range the effects of the frost was trifling. The outer ends of the corn leaves were touched as by a breath of fire, but the husks of the ears were safe, and the crop went on to maturity. On the great level north of the Erie canal, except in a few localities, the crops were scarcely affected, and the ameliorating influence of Oneida lake, combined with diminished elevation, was a perfect protection to vegetation on its borders. Every other large body of water did good service to the farmers that morning. In the vicinity of Skaneateles lake, Lima beans were the only vegetables touched. A month elapsed before we had another such a cold night.

Light colored and sandy soils, especially if they contain considerable vegetable matter, suffer more from late spring, and early autumn frosts, than darker ones.

Returns from fifty-eight different localities, scattered over this State, give, as their mean temperature, $46^{\circ}\frac{4}{100}$. The mean of Onondaga valley is $47^{\circ}\frac{18}{100}$, which is $0^{\circ}\frac{68}{100}$ above the average of the State. Pompey has a mean temperature of $42^{\circ}\frac{4}{100}$, being $3^{\circ}\frac{6}{100}$ less than the mean of the

State. The climate of Onondaga Academy may be safely taken as that of all the country north of the canal, while that of Pompey may, with some allowance, be taken for that lying in the southern part of the county, while the mean between, may be assumed as the average of that belt that lies on the salt group, Helderberg range, and the Marcellus shales. The range of temperature in Onondaga county from north to south is very great, the cold becoming more intense as we go south, owing to increased elevation.

Mr. Coffin says of Pompey, "It is the coldest place reported in the State; colder even than those in the extreme northern counties. But it is rather remarkable, that while this is the fact, the thermometer does not sink so low there in the winter, nor do the autumnal frosts occur so early as in the State generally." The escape from autumnal frosts is probably due to the fact that there is more wind blowing at Pompey Hill than in the valleys, and lower grounds of the county.

The length of the summer season in the State, generally, reckoning from the first blooming of the apple trees, to the first killing frost, is 174 days. In Onondaga it is from 174 to 180; thus giving us three more summer days than the average of the State, while Long Island has twelve and a half more, and St. Lawrence twenty-two days less than the average of the State.

Observations of the temperature have been taken at Fairmount, at a point 520 feet above the sea, for more than sixty years; and during that time a standard instrument in the shade, protected from all reflection, has never been observed to mark more than 94° in the hottest weather, and this but once in many years; and there have been but few days in the coldest weather that the mercury was not, at some time in the day, above zero.

February 5th and 6th, 1855, were the coldest days ever known here, and deserve a permanent record. The severe cold commenced

On the 4th, at 10 o'clock, P. M., 10° below zero.

do	5th, at	2	do	A. M.,	19°	do
do	do	6	do	do	28°	do
do	do	9	do	do	22°	do
do	do	11	do	do	20°	do
do	do	1	do	P. M.,	17°	do
do	do	2	do	do	16°	do
do	do	3	do	do	16°	do
do	do	5	do	do	18°	do
do	do	9	do	do	26°	do
do	6th, at	6	do	A. M.,	30°	do
do	do	8	do	do	26°	do
do	do	10	do	do	7°	do
do	do	11	do	do	0°	do
do	do	12	do	M.,	2° above zero.	

During this unprecedented weather the sky was nearly cloudless, and as there was no wind, the severity of the weather was not so apparent; but

the 5th of February, 1855, will probably stand on the records of observers as the coldest day of the century. The average annual range of the thermometer, at Onondaga, is 96° , while for the State, generally, it is 104° .

Thus our climate is less variable than most of the State where observations have been taken.

The average course of the winds in the county, is south 67° 8 min. west; while the average of the State is south 76° 54 min. west; giving 9° 46 min. more southing to our winds, and, of course, by so much greater warmth than the State generally.

The pastures are usually sufficiently started in the spring to turn our cattle to grass, from the 15th to the 20th of May, and from the middle of November to the first of December, we usually begin to withdraw them from the fields to the yards, and winter feeding begins; thus our farm stock is fed about one-half of the year, upon forage and grain that has been stored during the summer at great cost.

The annual average of water that falls in rain and snows at Pompey Academy, is 29.46 inches; at Onondaga, 31.40. Pompey is on the summit of the highlands, and Onondaga Academy is at the base. The distance between the two points of observation, in a direct line, is ten miles very nearly, and the difference in elevation is 1,343 feet, equal to 134 feet to the mile. Hills are condensers of the vapor in the air, but their own summits do not receive the benefit of the greatest fall of water. Along the base of the range, the showers are the most abundant, as is seen by Onondaga valley receiving two inches more than Pompey.

CHAPTER V.

AGRICULTURAL STATISTICS OF THE SEVERAL TOWNS OF ONONDAGA CO. CICERO.

Cicero is bounded on the north and east by Oneida lake and Chittenango creek, which divides it from Madison county; on the south by the towns of Manlius and De Witt, lapping a little on the town of Salina; and on the west by Clay.

This town is in the northeast corner of the county; its surface is level or rolling; its soil a loam; the north side of the town inclining to clay, the northwest corner having sand in excess.

There is a large swamp, on the south side of the middle of the town, extending from Cicero village to Chittenango creek, which contains about ten square miles, very little of it having been cultivated.

Water runs both east and west from this swamp, and its surface being twenty-five feet above Oneida lake, and about thirteen feet above Chittenango creek, where its outlet joins it, it might be drained at small cost, and rendered valuable for farming land. Several attempts have been made to accomplish this desirable object, but in consequence of the conflicting

views of owners, thus far, but little good has been done. A general and comprehensive plan is necessary, and must very soon be resorted to by the owners. There is another smaller swamp near the west end, and on the shore of the lake.

Until recently, a large business has been done in Cicero, connected with the manufacture of salt barrels, and cutting and drawing wood to the salt works at Syracuse. This is nearly over, the timber being used up; and the industry of the town is fast being turned to the improvement of its agriculture. It shows signs of progress and prosperity. Draining is required, not only of the swamps, but of most of what is called the dry soils. The surface is sufficiently high and rolling to render this practicable. The general surface is not more than four hundred feet above tide, and the protection that Oneida lake affords against frosts, makes its shore particularly desirable for the cultivation of the grape.

An extensive vineyard has been planted on one of the islands near South Bay.

The total number of acres in this town, 29,289.

Improved acres,.....	14,376	Unimproved,.....	14,913
do to each			
inhabitant,.....	4.24	Cash value of farms,...	\$1,145,868
Value of stock,.....	\$135,517	Tools and implements,.	\$43,452
Acres plowed in 1854,..	5,063 $\frac{1}{2}$	Acres fallow,.....	199 $\frac{1}{2}$
Acres pasture,.....	4,401 $\frac{1}{2}$	Acres, meadow,.....	3,161 $\frac{1}{2}$
Tons of hay,.....	3,391	Bushels of grass seed, .	204
Spring wheat, acres sown	26 $\frac{3}{4}$	Bushels harvested,....	298 $\frac{1}{2}$
Winter wheat, do	461 $\frac{1}{2}$	do	1,519 $\frac{1}{2}$
Oats, do	2,090 $\frac{5}{8}$	do	59,988
Rye, do	42	do	400
Barley, do	85 $\frac{3}{4}$	do	1,681 $\frac{1}{2}$
Buckwheat, do	324 $\frac{1}{2}$	do	3,492 $\frac{1}{2}$
Corn, do	1,688 $\frac{7}{8}$	do	44,304
Potatoes, do	441 $\frac{1}{2}$	do	24,842
Peas, do	187 $\frac{1}{8}$	do	3,504
Beans, do	19 $\frac{1}{4}$	do	380 $\frac{1}{2}$
Turnips, do	11 $\frac{1}{2}$	do	970
Tobacco, do	7 $\frac{1}{2}$	Pounds harvested,....	9,000
Flax, do	1 $\frac{1}{2}$	do of lint,.....	400
Bushels of seed,	4	Wine, galls,.....	136
Apples, bushels,	20,131	Cider, barrels,	569
Maple sugar, lbs.,.....	467	Molasses, galls.,	23 $\frac{1}{2}$
Honey, lbs.,.....	4,148	Beeswax, lbs.,.....	213 $\frac{1}{2}$
Neat cattle under one			
year,.....	383	Over one year,.....	769
Working oxen,.....	122	Cows,.....	1,324
Cattle killed for beef,..	128	Butter, lbs.,	129,140
Cheese, lbs.,.....	28,035	Milk, galls.,	510

Horses,	901	Swine under six months,	749
Swine over six months, .	803	Sheep,	2,253
Fleeces,	1,610	Wool, lbs.,	5,544½
Poultry sold, (value,)..	\$1,209	Eggs, value,	\$1,627
Fulled cloth made, yds.,	714½	Flannel, yards,	1,342
Linen do do	120½	Cotton and mixed, yds.,	727½
Value of produce of market gardens,			\$50

Post offices at Cicero Corners and Brewerton.

CLAY.

Bounded on the north by Oneida river, which separates it from Oswego county, on the east by Cicero, on the south by Salina, and on the west by Seneca river, which separates it from Lysander.

The general surface and soils of this town are quite like those of Cicero. Along Oneida river the land is low and in some places swampy. The southeast corner is sandy. The total number of acres in Clay, is 30,217.

Improved acres,	19,535½	Unimproved,	10,681½
Improved acres to each inhabitant,	5.87	Cash value of farms, ..	\$1,458,713
Cash value of stock, ...	\$171,212	do tools and implements,	43,887
Acres plowed in 1854,	7,393½	Acres, fallow,	187
Acres pasture, do	5,546½	do meadow,	4,645
Tons of hay,	4,671½	Bushels of grass seed, ..	278½
Spring wheat, acres sown	96½	Bushels harvested,	1,025
Winter do do	544½	do	2,475½
Oats, do	2,908½	do	76,995
Rye, do	177	do	2,433
Barley, do	505½	do	9,794
Buckwheat, do	395	do	4,075
Corn, do	2,187½	do	55,937
Potatoes, do	419	do	34,011
Peas, do	128½	do	2,314½
Beans, do	50½	do	768½
Turnips, do	6½	do	1,689
Tobacco, do	24½	Pounds harvested,	27,765
Flax, do	2½	do of lint,	50
Bushels of flax seed, ..	24	Wine, galls.,	47
Apples, bushels,	27,578	Cider, barrels,	680
Maple sugar, lbs.,	665	Molasses, galls.,	40
Honey, do	3,677	Beeswax, lbs.,	179½
Neat cattle under 1 year,	512	Over one year,	1,002
Working oxen,	169	Cows,	1,363
Cattle killed for beef, ..	378	Butter, lbs.,	120,907
Cheese, lbs.,	11,535	Milk, galls.,	840
Horses,	1,177	Swine under six months,	878
Swine over six months,	1,114	Sheep,	4,292
Fleeces,	3,447	Wool, lbs.,	12,358'

Poultry sold, value,....	\$1,212	Eggs sold,	\$2,239
Fulled cloth made, yds.,	739½	Flannel, yds.,	1,195
Linen do do	296	Cotton and mixed, yds.,	1,087
Market gardens, acres		Value of products,	\$800
cultivated,	15½		

The post offices in Clay are at Belgium, Euclid, Centerville, and Three River Point.

LYSANDER.

Bounded on the north by the county line of Oswego; on the east by Seneca river; on the south by Seneca river which separates it from Geddes, Van Buren and Elbridge; and on the west by Cross lake, and the line of the county of Cayuga.

The soil of this town is generally of excellent quality, the eastern part, particularly that which lies in the bow of the river, is very superior. In the center, north of Baldwinsville, there are some swamps not yet brought into cultivation, but destined to be valuable when cleared and drained. West of Baldwinsville there is a considerable tract of sandy loam. The western portion of the town is excellent wheat land. Lysander is not as level as Cicero and Clay, but no part of it is so hilly as to be of any real disadvantage. These three towns lying along the north line of the county are destined to be of great value; they are now comparatively new, but the farmers are improving rapidly, and the time is not far distant, when the intrinsic value of their soils will be better understood and appreciated. This was once the great lumber district, and the pine stumps which have been in the way of perfect cultivation, are now placed around the fields they once encumbered, making good and lasting fences. The total number of acres in Lysander is 37,398½.

Improved acres,	27,060½	Unimproved,	10,329
Improved acres to each inhabitant,	5.35	Cash value of farms, ...	\$1,777,046
Cash value of stock, ...	\$243,259	do tools and implements,	52,678
Acres plowed in 1854, .	8,924	Acres, fallow,	642
Acres pasture do	9,124½	do meadow,	4,801½
Tons of hay,	5,753½	Bushels of grass seed, .	105½
Spring wheat, acres sown	106	Bushels harvested,	966
Winter do do	2,016½	do	13,534
Oats do	3,165½	do	91,976½
Rye, do	104½	do	1,235½
Barley, do	1,197½	do	23,125½
Buckwheat, do	423½	do	4,905
Corn, do	3,076	do	91,623
Potatoes, do	421½	do	38,268
Peas, do	88	do	1,455
Beans, do	173½	do	2,995
Turnips, do	16½	do	2,676

Tobacco, do	20½	Pounds harvested,.....	28,544
Apples (bushels),.....	48,181	Cider, barrels,.....	1,373½
Maple sugar, lbs.,.....	905	Molasses, gallons,.....	37
Wine, galls.,	196		
Honey, lbs.,.....	6,120	Wax, lbs.,	336½
Neat cattle under one year,....	795	Over one year,.....	1,677
Working oxen,	278	Cows,	1,949
Cattle killed for beef,..	476	Butter, lbs.,.....	207,813
Cheese, lbs.,	40,738	Milk sold, gallons,	1,598
Horses,	1,430	Swine under six months,	1,610
Swine over six months, ..	1,702	Sheep,	7,494
Fleeces,	5,082	Wool,.....	19,104
Value of poultry sold, .	\$2,431	Value of eggs sold,....	\$3,690
Yards of fulled cloth made,.....	601½	Flannel made, yds,....	1,201
Linen, yards made,	209	Cotton and mixed,	459
Market gardens, acres cultivated,	2	Value of products,	\$350

Post offices in Lysander are at Baldwinsville, Lysander, Little Utica, Plainville, Polkville and Lamson's.

ELBRIDGE.

Bounded on the north by Cross lake, and the towns of Lysander and Van Buren; on the east by Camillus; south by Skaneateles and Cayuga county, and west by Cayuga.

The north part of the town is low, and generally level; the south part reaches up to the Helderberg range of rocks. The Erie canal passes through it, from east to west, and Skaneateles creek, from north to south. The soil, which is good, is made up, principally, from northern drift, and the shales of the Salt group. The total number of acres in this town is 21,420½.

Improved acres,.....	16,792½	Unimproved,	4,638
do to each inhabitant,	3.68	Cash value of farms,...	\$1,302,058
Cash value of stock, ...	\$164,722	do tools and im-plements,	36,636
Acres plowed in 1854,...	6,374½	Acres fallow,.....	843
pasture do ..	4,375	meadow,	2,586
Tons of hay,	3,209	Bushels grass seed,....	195½
Spring wheat, acres sown,	10	Bushels harvested,	62
Winter do do	1,848½	do	11,254
Oats, do	1,700	do	49,318
Rye, do	34½	do	520
Barley, do	1,148½	do	24,263
Buckwheat, do	143½	do	1,569
Corn, do	1,991½	do	62,324

Potatoes, acres sown,	219 $\frac{3}{4}$	Bushels harvested,	17,670
Peas, do	12 $\frac{1}{2}$	do	197
Beans, do	22 $\frac{3}{4}$	do . . .	386 $\frac{3}{4}$
Turnips, do	11	do	2,392
Tobacco, do	11	do	12,000
Apples, bushels,	26,816	Cider, barrels,	760
Maple sugar, lbs.,	14	Molasses, gallons,	2
Honey, lbs.,	4,647	Wax, pounds,	199
Neat cattle, under 1 y'r,	428	Over 1 year,	990
Working oxen,	141	Cows,	1,215
Cattle killed for beef, ..	297	Butter, lbs.,	120,304
Cheese, lbs.,	17,730	Milk sold, gallons,	850
Horses,	879	Mules,	4
Swine, under 6 months,	765	Over six months, ...	1,328
Sheep,	5,325	Fleeces,	3,821
Wool, lbs.,	13,455	Eggs sold, value,	\$1,700
Poultry sold, value, ...	\$1,166	Flannel, yds.,	221
Fulled cloth made, yds.,	69	Cotton and mixed,	20
Linen do	64	Value of products,	\$20
Market garden, acres cul- tivated,	1		
Post offices—Elbridge, Jordan, Jack's Reefs, and Hart Lot.			

VAN BUREN.

Bounded on the north by Lysander, from which it is separated by the Seneca river; on the east by Lysander and Geddes; on the south by Camillus and Elbridge, and on the west by Elbridge and Lysander.

The surface is level or rolling; some extensive swamps lie along the Erie canal, near the south line. The soil is generally good; in some places coarse sand, or fine gravel and cobble stones, are in excess. Where the land is not swampy, it consists principally of drift. Total number of acres in Van Buren is 21,405.

Improved acres,	17,301	Unimproved,	4,104
do to each in- habitant,	5.60	Cash value of farms, ...	\$1,257,541
Cash value of stock, ...	\$149,537	do tools and im- plements,	43,547
Acres plowed in 1854, ...	5,216 $\frac{1}{2}$	Acres fallow,	612
pasture do ..	4,557 $\frac{1}{2}$	meadow,	2,496 $\frac{1}{2}$
Tons of hay,	2,830 $\frac{3}{4}$	Bushels of grass seed, ..	66
Spring wheat, acres sown,	55	Bushels harvested,	695 $\frac{1}{2}$
Winter do do	1,642	do	10,234
Oats, do	2,414	do	74,167
Rye, do	$\frac{3}{4}$	do	12
Barley, do	832 $\frac{3}{4}$	do	17,836
Buckwheat, do	151 $\frac{1}{2}$	do	1,650 $\frac{1}{2}$
Corn, do	2,231 $\frac{1}{2}$	do	64,125

Potatoes, acres sown,	255 $\frac{3}{4}$	Bushels harvested,	22,947
Peas, do	15	do	298
Beans, do	47 $\frac{3}{4}$	do	750 $\frac{1}{2}$
Turnips, do	2 $\frac{3}{8}$	do	695
Hops, do	8	do ....	...
Tobacco, do	16 $\frac{1}{2}$	Pounds harvested,.....	23,800
Apples, bushels,	39,141	Cider, barrels,.....	912
Wine, gallons,.....	14		
Honey, pounds,.....	3,230	Wax, pounds,	165 $\frac{1}{2}$
Neat cattle, under 1 y'r,	430	Over 1 year,	969
Working oxen,.....	98	Cows,	1,262
Cattle killed for beef,..	262	Butter, pounds,.....	133,425
Cheese, pounds,.....	21,640	Horses,.....	902
Swine, under 6 months,	1,040	Over 6 months,	996
Sheep,	3,152	Fleeces,	2,594
Wool, pounds,	9,597	Value of eggs sold,....	\$2,571
Value of poultry sold,..	\$958	Flannel, yards,	66
Fullled cloth made, yds.,	17		

Post offices—Canal, Van Buren Center, and Van Buren.

CAMILLUS.

Bounded north by Van Buren, east by Geddes, south by Onondaga and Marcellus, and west by Elbridge. Surface, rolling, having many drift hills in the north part, and the south part reaching up to the Helderberg range. Nine mile creek runs through from near the southwest corner, in a northeasterly direction, passing out of the town on its east side. This creek runs through a deep valley in the south part of the town, and has steep slopes on both its sides. Along the canal are some swamps, but generally the land is dry; most of the soil is made of the gypseous shales. The total number of acres in Camillus, is 19,985 $\frac{1}{4}$.

Improved acres,	16,411	Unimproved,	3,574 $\frac{1}{4}$
do to each		Cash value of farms, ..	\$1,165,840
inhabitant,.....	5.98	do tools and	
Cash value of stock,...	\$142,934	implements,.....	35,583
Acres plowed in 1854,	6,100 $\frac{1}{4}$	Acres, fallow,	556 $\frac{1}{4}$
do pasture do	4,394 $\frac{1}{2}$	do meadow,	2,064 $\frac{3}{4}$
Tons of hay,	2,566	Bushels grass seed,....	51
Spring wheat, acres sown	31 $\frac{3}{4}$	Bushels harvested,	336
Winter do do	2,085 $\frac{1}{2}$	do	10,006 $\frac{1}{2}$
Oats, do	1,980 $\frac{1}{2}$	do	59,781
Barley, do	1,412 $\frac{1}{2}$	do	32,969
Buckwheat, do	82 $\frac{3}{4}$	do	588 $\frac{1}{2}$
Corn, do	1,883 $\frac{1}{4}$	do	58,060
Potatoes, do	227 $\frac{1}{2}$	do	19,857
Peas, do	16 $\frac{1}{2}$	do	145
Beans, do	14 $\frac{3}{4}$	do	

Turnips, acres sown,	4½	Bushels harvested,	937
Hops, do	3	Pounds,	2,000
Tobacco, do	5¼	do	9,000
Apples, bushels,	30,343	Cider, bbls.,	645½
Wine, galls.,	576	Honey, lbs.,	1,194
Beeswax, lbs.,	119		
Neat cattle under 1 year,	435	Neat cattle over 1 year,	636
Working oxen,	94	Cows,	1,047
Cattle killed for beef, ..	171	Butter, lbs.,	110,209
Cheese, lbs.,	12,470	Horses,	879
Mules,	4	Swine, under 6 months,	1,085
Swine over six months,	848	Sheep,	5,649
Fleeces,	5,137	Wool, lbs.,	20,230
Value poultry sold,	\$1,128	Value eggs sold,	\$1,457
Filled cloth made, yds.,	3	Flannel, yds.,	60
Cotton and mixed, yds.,	40		

Post offices, Camillus, Bellisle, Fairmount.

GEDDES.

Bounded on the north by the town of Salina, from which it is separated by Onondaga lake; on the east by the City of Syracuse; on the south by Onondaga; on the west by Camillus and Van Buren.

The surface of this town is rolling, and made up of the small drift hills and gypseous shales. There is some low land about the head of the lake, but most of the soil is dry and fertile.

The total number of acres in the town of Geddes, is 6,258¾.

Improved acres,	4,786	Unimproved,	1,472¾
do to each		Cash value of farms, ...	\$816,446
inhabitant,	2.31	do tools and	
Cash value of stock, ...	\$90,084	implements,	15,464
Acres plowed in 1854, ..	1,780¾	Acres, fallow,	288½
do pasture do	1,133¾	do meadow,	899
Tons of hay,	969¼	Grass seed, bushels,	3
Spring wheat, acres sown	1½	Bushels harvested,	15½
Winter do do	377	do	1,358
Oats, do	770½	do	21,151½
Barley, do	183½	do	4,256
Buckwheat, do	26¾	do	92¾
Corn, do	507½	do	12,164
Potatoes, do	124½	do	10,834½
Peas, do	27	do	364
Beans, do	2	do	55½
Turnips, do	6½	do	1,260
Tobacco, do	9¼	Pounds harvested,	7,563
Apples, bushels,	4,067	Cider, barrels,	57½
Wine, galls.,	114	Honey, lbs.,	2,100

Beeswax,	68	Neat cattle under 1 year,	49
Cattle over one year, ..	129	Working oxen,	23
Cows,	904	Cattle killed for beef, ..	24
Butter, lbs.,	40,945	Cheese, lbs.,	5,150
Milk sold, galls.,	2,515	Horses,	629
Swine under 6 months, ..	240	Swine over six months,	876
Sheep,	863	Fleeces,	603
Wool, lbs.,	2,191	Value of poultry sold, .	\$452
Value of eggs sold,	\$564	Flannel made, yds., ...	41
Post office, Geddes.			

SALINA.

Bounded on the north by Clay; on the east by De Witt; south by the city of Syracuse and Onondaga lake; west by lake and Seneca river. Surface level, soil dry, except some small swamps. Sand is in excess at the southeast corner of the town. Drift and the red shales of the salt group make up and constitute a fruitful soil for most of the whole surface. The total number of acres in Salina is 8,778½.

Improved acres,	6,559½	Unimproved,	2,219
do to each inhabitant,	2.54	Cash value of farms, ..	\$731,371
Cash value of stock, ...	\$51,901	do tools and implements,	12,438
Acres plowed in 1854, ..	2,380½	Acres fallow,	158½
do pasture do	1,755	do meadow,	1,413
Tons of hay,	1,559	Grass seed, bushels, ...	4½
Spring wheat, acres sown	51	Bushels harvested,	519
Winter do do	196½	do	818
Oats, do	729½	do	19,928
Rye, do	26	do	244
Barley, do	118½	do	2,833
Buckwheat, do	62½	do	423
Corn, do	801½	do	19,919
Potatoes, do	240½	do	15,550
Peas, do	32½	do	439
Beans, do	14½	do . . .	227
Turnips, do	2½	do	636
Tobacco, do	72	Pounds harvested,	90,883
Flax, do	1	do of lint,	2,000
Flax seed, bushels,	10	Apples, bushels,	4,021
Cider, barrels,	107	Maple sugar, lbs.,	400
Molasses, gallons,	50	Wine, gallons,	160
Honey, lbs.,	854	Beeswax,	31
Neat cattle under one year,	80	Over one year,	260
Working oxen,	54	Cows,	427
Cattle killed for beef, ..	149	Butter, lbs.,	44,732
[AG. TRANS.]			

Cheese, lbs.,	400	Milk, gallons sold,	56,740
Horses,	333	Swine under six months,	354
Swine over six months,	320	Sheep,	1,557
Fleeces,	1,246	Wool, lbs.,	4,010½
Value of poultry sold, .	\$533	Value of eggs sold,	\$402
Fulled cloth made, yds.,	18		
Linen do	12	Flannel, yds.,	64
Market gardens, acres			
cultivated,	19½	Value of products,	\$1,733
Post office, Liverpool.			

DE WITT.

Bounded on the north by Cicero; east by Manlius; south by Pompey and La Fayette; west by Onondaga, the city of Syracuse and Salina.

The north half of this town is level or rolling, the south half is hilly, and cut up by valleys having steep sides. Considerable areas are rocky, and, therefore, difficult of cultivation. Most of the soil is made of drift, the shales of the salt group, and disintegrated rocks of the Helderberg range, and therefore very fruitful. Total number of acres in De Witt is 21,937½.

Improved acres,	15,643½	Unimproved,	6,294
do to each		Cash value of farms, ...	\$1,659,487
inhabitant,	5.24	do tools and	
Cash value of stock, ...	\$146,471	implements,	\$46,404
Acres plowed in 1854, .	5,189½	Acres fallow,	463
do pasture do	4,700	do meadow,	3,180½
Tons of hay,	3,344	Bushels grass seed,	66
Spring wheat, acres sown	88	do harvested,	791½
Winter do do	1,188	do do	3,542
Oats, do	1,821½	do do	49,230
Rye, do	2	do do	5
Barley, do	298½	do do	5,740
Buckwheat, do	145½	do do	1,041
Corn, do	1,897	do do	44,580
Potatoes, do	227½	do do	14,321
Peas, do	205½	do do	3,065
Beans, do	7½	do do	90
Turnips, do	5½	do do	72
Tobacco, do	28½	Pounds harvested,	32,525
Apples, bushels,	12,564	Cider, barrels,	566
Maple sugar, lbs,	6		
Honey, lbs.,	2,675	Wax,	108½
Neat cattle under one			
year,	290	Over one year,	688
Working oxen,	190	Cows,	1,170
Cattle killed for beef, ..	82	Butter, lbs.,	97,235

Cheese, lbs.,	13,360	Milk sold, gallons,	67,856
Horses,	831	Swine under six months,	728
Swine over six months, ..	804	Sheep,	3,686
Fleeces,	2,748	Wool, lbs.,	10,291
Value of poultry sold, ..	\$991	Value of eggs sold, ...	\$2,048
Flannel made, yds., ...	36	Cotton and mixed, yds.,	104
Market gardens, acres cultivated,	5½	Value of products,	\$385
Post offices, Jamesville. De Witt, Collamer.			

MANLIUS.

Bounded north by Clay and Madison county, from which it is divided by the Chittenango creek; east by Madison county; south by Pompey, and west by De Witt.

The topography and soils of this town are similar to those of De Witt; Limestone and Butternut creeks run through, and unite with each other in the north part of the town, and then flow into the Chittenango.

The total number of acres in Manlius is 29,186½.

Improved acres,	21,640½	Unimproved,	7,546½
do to each inhabitant,	3.47	Cash value of farms, ..	\$1,513,431
Cash value of stock, ...	\$173,079	do of tools and implements,	38,937
Acres plowed in 1854, ..	7,995½	Acres fallow	1,140
Acres pasture in 1854, ..	5,775	Acres meadow,	3,544½
Tons of hay,	3,423½	Bushels, grass seed, ...	557½
Spring wheat, acres sown	84½	Bushels harvested,	824
Winter wheat, do	1,946½	do	5,470¼
Oats, do	3,161½	do	72,923
Rye, do	5½	do	3
Barley, do	524½	do	10,951
Buckwheat, do	160½	do	1,208½
Corn, do	2,572½	do	61,132
Potatoes, do	272½	do	17,975
Peas, do	184½	do	2,320
Beans, do	28½	do	233
Turnips, do	1½	do	110½
Tobacco, do	76½	Pounds harvested,	75,004
Flax, do	2½	Pounds of lint,	2,750
Flax seed, bushels,	18½	Apples, bushels,	25,176
Cider, bbls.,	734½	Wine, galls.,	2
Honey, lbs.,	6,407	Beeswax, lbs.,	267
Neat cattle under 1 year	488	Over one year,	941
Working oxen,	119	Cows,	1,365
Cattle killed for beef, ..	126	Butter, lbs.,	130,077
Cheese, lbs.,	9,890	Milk sold, galls.,	11,395
Horses,	1,109	Swine under six months	799

Swine over six months, .	1,242	Sheep,	4,160
Fleeces,	3,790	Wool, lbs.,	12,970½
Value of poultry sold, .	\$859	Value of eggs sold, .	\$2,004
Fulled cloth, yards, .	145	Flannel, yards,	255
Linen do	96	Cotton and mixed, yds.,	88
Market garden, acres cul-		Value of products, .	\$50
tivated,	½		

Post offices—Manlius, Fayetteville, Manlius Centre, Manlius Station, Kirkville, North Manlius.

POMPEY.

Bounded on the north by De Witt and Manlius; on the east by Madison county; on the south by Fabius; on the west by La Fayette.

This town is principally on the Marcellus and Hamilton Shales, the northeast corner reaching down to the Helderberg range.

Pompey Hill is 1,743 feet above tide, and from this point the surface slopes in every direction, the waters flowing from it to the north into the St. Lawrence, and to the south into Chesapeake Bay. Although there is a hill in Spafford, higher than any land in Pompey, the general surface is above any other town in the county. The soil, except in the valleys, is made by the disintegration of the underlying rocks, and, except the north part, it is best adapted to grazing.

The total number of acres is 40,706½.

Improved acres,	32,420½	Unimproved,	8,286
Improved acres to each inhabitant,	8.60	Cash value of farms, .	\$1,856,475
Value of stock,	\$235,582	Tools and implements, .	\$75,358
Acres plowed in 1854, .	12,943½	In fallow,	313
Acres, pasture,	10,320	In meadow,	5,889½
Tons of hay,	5,238	Bushels of grass seed, .	804
Spring wheat, acres sown	1,325	Bushels harvested, .	16,404
Winter wheat, do	588½	do	2,676
Oats, do	4,200	do	84,332
Rye, do	30	do	300
Barley, do	2,595½	do	45,493
Buckwheat, do	227½	do	2,033
Corn, do	2,141¾	do	65,070
Potatoes, do	356½	do	25,457
Peas, do	655¾	do	9,760
Beans, do	12¾	do	196
Turnips, do	2	do	220
Flax, do	10	Pounds of lint,	3,500
Bushels of flax seed, .	182½		
Hops, acres sown, .	1¾	Pounds harvested, .	2,500
Tobacco, do	18½	do	19,793
Apples, bush. produced,	39,417	Cider, bbls.,	800

Market gardens, acres			
cultivated,	1½	Value of products,...	\$230
Maple sugar, lbs.,	3,321	Maple molasses, galls.,	214
Wine, galls.,	34	Honey, lbs.,	6,945
Wax, lbs.,	324	Neat cattle under 1 yr old	670
Cattle, over 1 year old,.	1,207	Working oxen,	164
Cows,	1,894	Killed for beef,	233
Butter, lbs.,	194,815	Cheese, lbs.,	43,680
Horses,	1,427	Swine under six months,	976
Swine over six months,.	1,053	Sheep,	9,338
Fleeces	10,278	Wool, lbs.,	38,657
Value of poultry sold,.	\$1,651	Eggs, sold,	\$3,486
Fulled cloth made, yds.,	14	Flannel, yards,	347
Linen do do	36	Cotton and mixed,	67

Post offices—Pompey, Delphi, Watervale, Oran, and Pompey Centre.

LA FAYETTE.

Bounded on the north by De Witt and Onondaga; on the east by Pompey; on the south by Fabius and Tulley; on the west by Otisco and Onondaga.

This town is mostly on high land. The west side is traversed by the valley of the Onondaga creek, and the Butternut creek valley reaches the whole length of the town on the east side. Except the drift in these valleys, the soil is principally made from the shales of the Marcellus and Hamilton groups. It is well adapted to grazing. Total number of acres in La Fayette is 23,986.

Improved acres,	18,004	Unimproved,	5,982
do to each inhabitant,	7.69	Cash value of farms,...	\$1,084,545
Cash value of stock,....	\$123,390	do tools and improvements,	\$38,357
Acres plowed in 1854, ..	7,084½	Acres fallow,	252½
pasture do ..	5,171	meadow,	2,761½
Tons of hay,	2,528½	Bushels grass seed,....	865½
Spring wheat, acres sown,	434½	Bushels harvested,	4,642
Winter do do	869½	do	4,862
Oats, do	3,008	do	58,440
Barley, do	1,456½	do	27,868
Buckwheat, do	97½	do	985
Corn, do	1,313½	do	40,520
Potatoes, do	190½	do	15,291
Peas, do	96½	do	1,373
Beans, do	8½	do ...	140
Turnips, do	5	do	108
Hops, do	1½	Pounds harvested,....	1,400
Tobacco, do	1	do	1,200
Apples, bushels,	36,368	Cider, barrels,....	443½

Maple sugar, pounds, ..	8,898	Molasses, gallons,	557
Honey, pounds,	10,321	Beeswax, pounds,	373
Neat cattle, under 1 y'r,	301	Over 1 year,	614
Working oxen,	79	Cows,	1,088
Cattle killed for beef, ..	97	Butter, pounds,	114,382
Cheese, pounds,	6,915	Horses,	811
Swine, under 6 months, ..	621	Over 6 months,	761
Sheep,	3,359	Fleeces,	3,762
Wool, pounds,	14,470½	Value of poultry sold, ..	\$1,009
Value of eggs sold,	\$2,753	Fulled cloth, yards, ...	101
Flannel, yards,	341	Linen do ...	79
Cotton and mixed,	85		

Post offices—La Fayette, Cardiff, Linn.

ONONDAGA.

Bounded north by Camillus, Geddes and the City of Syracuse; east by De Witt and La Fayette; south by La Fayette and Otisco; west by Marcellus and Camillus.

The surface of this town is uneven, having the valley of Onondaga creek running from south to north through its whole width, and a deep valley from the Onondaga to the Nine Mile creek. In this valley the whole of the Marcellus shales are removed, and the upper measures of the limestone of the Helderberg range appear. On the north side and near the west corner, the lime rocks are exposed in steep and perpendicular walls. The valley of the Onondaga creek is filled with drift, and sheltered from the west winds: it is among the most valuable farming districts in the State. Although there are many places where the lime stone outcrop, yet they occupy but small areas, and nearly all of the town is susceptible of cultivation. Some of the high lands require draining to make them valuable.

Total number of acres in Onondaga, is 40,848½.

Improved acres,	33,001½	Unimproved,	7,846½
do to each inhabitant,	6.10	Cash value of farms, ..	\$2,817,658
Cash value of stock, ...	\$272,247	do tools and implements,	\$77,169
Acres plowed in 1854, ..	12,585½	Acres, fallow,	919
do pasture do ..	8,500½	do meadow,	5,439
Tons of hay,	5,677½	Bushels grass seed,	114
Spring wheat, acres sown	720	Bushels harvested,	9,421½
Winter wheat, do	3,060½	do	13,181½
Oats, do	4,482½	do	111,077
Rye, do	7½	do	109
Barley, do	2,128	do	38,443
Buckwheat, do	211½	do	2,125½
Corn, do	3,230	do	93,713
Potatoes, do	520½	do	40,518
Peas, do	281½	do	4,226

Beans, acres sown,	20	Bushels harvested,....	379½
Turnips, do	9½	do	1,057
Tobacco, do	21	Pounds harvested, . . .	22,550
Apples, bushels.	73,302	Cider, barrels,....	3,046½
Maple sugar, lbs.,....	2,180	Molasses, galls,....	83
Wine, galls.,	117	Honey, lbs.,	9,540
Beeswax, lbs.,	446	Neat cattle under 1 year,	615
Cattle over 1 year,	1,228	Working oxen,	208
Cows,	2,034	Cattle killed for beef,..	211
Butter, lbs.,	223,343	Cheese, lbs.,	23,139
Milk sold, galls.,	173,830	Horses,	1,621
Swine under six months,	1,559	Swine, over 6 months,..	1,718
Sheep,	11,660	Fleeces,	9,721
Wool,	36,639½	Value of poultry sold,..	\$384
Value of eggs sold,....	\$7,509	Fulled cloth, yds.,....	237
Flannel, yds.,	930½	Cotton and mixed,	116
Market gardens, acres cultivated,	180½	Value of products,	\$11,591

Post offices—Onondaga, Onondaga Valley, South Onondaga, Navarino, Onondaga Castle, Howlet Hill and West Onondaga.

MARCELLUS.

Bounded north by Camillus, east by Onondaga, south by Otisco and Spafford, and west by Skaneateles.

Nine-mile creek runs from south to north through this town, dividing its surface into unequal parts—the largest part of the town being on the east side of the creek. The surface is uneven and hilly, but well adapted to grazing. The soil is mostly made from the Marcellus Shales.

The total number of acres in Marcellus is 18,877½.

Improved acres,	15,558½	Unimproved,	3,319½
Improved acres to each inhabitant,	6.10	Cash value of farms,...	\$950,092
Cash value of stock,...	\$132,534	Cash value of tools and implements,	\$31,673
Acres plowed in 1854..	5,739½	Acres fallow,	196
Acres pasture in 1854..	4,692	Acres meadow,	2,695½
Tons of hay,	2,756½	Bushels grass seed,....	117
Spring wheat, acres sown	387½	Bushels harvested,	5,065
Winter wheat, do	766½	do	4,893½
Oats, do	1,465½	do	31,461
Rye, do	1	do	14
Barley, do	1,437½	do	23,767
Buckwheat, do	84½	do	1,172½
Corn, do	1,409½	do	40,668
Potatoes, do	207½	do	18,220
Peas, do	37	do	548
Beans, do	18½	do	452

Turnips, acres sown,...	18½	Bushels harvested,	3,273
Tobacco, do ...	113	Pounds harvested,.....	145,310
Apples, bushels,	35,395	Cider, bbls.,.....	756
Maple sugar, lbs.,.....	225	Molasses, galls.,	17
Honey, lbs.,.....	1,458	Beeswax, lbs.,.....	89½
Neat cattle under 1 year	340	Over one year,.....	685
Working oxen,.....	92	Cows,	990
Cattle killed for beef,..	112	Butter, lbs.,.....	95,150
Cheese, lbs.,.....	13,073	Horses,.....	780
Swine under 6 months,..	596	Over six months,.....	618
Sheep,	7,079	Fleeces,	6,051
Wool,	24,253	Value of poultry sold, .	\$1,273
Value of eggs sold,....	\$1,650	Fulled cloth made, yds.,	46
Flannel, yards,	79	Linen do do	45
Cotton and mixed, yards,	46		

Post offices—Marcellus, Marcellus Falls, Marietta, and Thorn Hill.

SKANEATELES.

Bounded north by Elbridge, east by Marcellus and Skaneateles lake, and south and west by Cayuga county.

The Helderberg range runs along the north line of this town. The surface of the north part is rolling—of the middle and southern parts more hilly—but the slopes are gentle. The soil is generally good, and in a high state of cultivation. Underdraining was resorted to many years ago, and with marked advantage. The south part of the town is divided nearly midway by the lake. The dry soils approach quite to the shore.

The total number of acres in the town of Skaneateles is 24,914½.

Improved acres,.....	20,935½	Unimproved,	3,979
Improved acres to each inhabitant,.....	527	Cash value of farms, ..	\$2,303,672
Cash value of stock,...	\$154,320	Cash value of tools and implements,.....	\$53,967
Acres plowed in 1854..	7,666	Acres fallow,.....	149½
Acres pasture in 1854..	6,309½	Acres meadow.....	4,196½
Tons of hay,.....	3,756	Bushels grass seed, ...	341½
Spring wheat, acres sown	466	Bushels harvested,....	5,735
Winter wheat, do	759½	do	4,264½
Oats, do	1,611½	do	36,056
Barley, do	2,169½	do	33,806
Buckwheat, do	276¾	do	3,137
Corn, do	1,892	do	50,265
Potatoes, do	161	do	13,076
Peas, do	66½	do	699
Beans, do	52½	do	785
Turnips, do	5½	do	1,103
Tobacco, do	44½	Pounds,	48,550
Flax, do	7½	Pounds of lint,	1,500

Flax seed, bushels,	67	Apples, bushels,	45,658
Cider, bbls.,	674	Maple sugar, lbs.,	2,865
Molasses, galls.,	41	Wine, galls.,	10
Honey, lbs.,	4,787	Wax, lbs.,	123
Neat cattle under 1 year	483	Over one year,	899
Working oxen,	146	Cows,	1,081
Cattle killed for beef, ..	197	Butter, lbs.,	90,223
Cheese, lbs.,	23,286	Milk sold, galls.,	8,000
Horses,	886	Swine under six months,	729
Swine over six months, ..	662	Sheep,	8,937
Fleeces,	8,602	Wool, lbs.,	32,373
Value of poultry sold, ..	\$2,614	Value of eggs sold,	\$2,982
Fulled cloth made, yds.,	51	Flannel, yards,	192
Linen do do	92		

Post offices—Skaneateles, Mottville, Mandana.

SPAFFORD.

North by Skaneateles and Marcellus; east by Otisco and Tully; south by Cortland county; and west by Cayuga county.

This town is on the ridge of land between the Skaneateles and Otisco valleys. The north end of the town is rolling and quite like the surface of the south part of Skaneateles. South of the village of Borodino the land rises rapidly, and near the south side of the town it is 1982½ feet above tide, and 1122½ feet above Skaneateles lake. This point, Ripley Hill, is not more than two miles from the lake, and not much more than that distance from Nine Mile creek valley. These abrupt hills are cut in many places by the streams that run from them, into deep ravines. The Genesee slates, and the lower measures of the Ithaca group make the soils of the south, while the Hamilton slates make those of the north part of the town. The total number of acres in Spafford is 20,073.

Improved acres,	15,643½	Unimproved,	4,429½
do to each		Cash value of farms, ..	\$726,652
inhabitant,	8.61	do tools and	
Cash value of stock, ...	\$115,088	implements,	\$28,216
Acres plowed in 1854, .	6,743	Acres fallow,	68
do pasture do	5,320½	do meadow,	2,661½
Tons of hay,	2,159½	Bushels grass seeds, ...	70½
Spring wheat, acres sown	1,419	do harvested,	16,862
Winter do do	258	do	1,312½
Oats, do	1,173½	do	21,143
Rye, do	4	do	50
Barley, do	1,917½	do	28,951
Buckwheat, do	170½	do	1,595½
Corn, do	1,044	do	30,305
Potatoes, do	133	do	12,800
Peas, do	83½	do	951½

Beans, acres sown,	18½	Bushels harvested,	563½
Turnips, do	1	do	356
Flax, do	271½	Pounds harvested,	42,500
Flax seed, bushels,	2,193	Apples, bushels,	41,900
Cider, barrels,	572½	Maple sugar, lbs.,	4,112
Molasses, gallons,	78	Honey, lbs.,	5,442
Wax, lbs.,	388½	Neat cattle under 1 year,	364
Neat cattle over 1 year,	754	Working oxen,	96
Cows,	906	Cattle killed for beef, ..	80
Butter, lbs.,	99,575	Cheese, lbs.,	8,320
Horses,	703	Swine under six months,	520
Swine over six months,	499	Sheep,	4,430
Fleeces,	5,552	Wool, lbs.,	21,580
Value of poultry sold, .	\$1,376	Value of eggs sold,	\$2,035
Fulled cloth made, yds.,	155	Flannel, yds.,	245
Linen do	76	Cotton and mixed, yds.,	234

Post offices, Borodino, Spafford and Spafford Hollow.

OTISCO.

Bounded north by Marcellus and Onondaga; east by La Fayette and Tully; south by Tully and Spafford; west by Spafford.

This town is mostly on the Tully limestone, and its soil is largely influenced by it. The valley of the Otisco lake is on the west side, giving steep slopes from the high table land that makes up most of the town. The total number of acres is Otisco is 18,606½.

Improved acres,	14,803½	Unimproved,	3,803
do to each		Cash value of farms, ...	\$708,787
inhabitant,	8.58	do tools and	
Cash value of stock, ...	\$106,409	implements,	\$31,183
Acres plowed in 1854, .	5,759	Acres fallow,	93½
do pasture do	4,882	do meadow,	2,154½
Tons of hay,	1,855½	Bushels grass seed,	37½
Spring wheat, acres sown	1,089½	do harvested,	12,343½
Winter do do	336½	do	2,271
Oats, do	1,466½	do	28,099
Barley, do	1,682	do	22,494½
Buckwheat, do	60½	do	683½
Corn, do	719	do	20,352
Potatoes, do	180½	do	15,620
Peas do	48½	do	598½
Beans, do	6½	do	105
Turnips, do	9½	do	1,277
Tobacco, do	1	Pounds harvested,	1,500
Apples, bushels,	48,715	Cider, barrels,	434½
Maple sugar, lbs.,	8,210	Molasses, gallons,	86
Wine, gallons,	3	Honey, lbs.,	2,015

Wax, lbs.,	124½	Neat cattle under 1 year,	311
Neat cattle over 1 year,	568	Working oxen,	119
Cows,	899	Cattle killed for beef, . .	58
Butter, lbs.,	83,887	Cheese, lbs.,	22,613
Horses,	648	Swine under 6 months, .	591
Swine over six months,	531	Sheep,	5,064
Fleeces,	4,885	Wool, lbs.,	19,397
Value of poultry sold, .	\$686	Value of eggs sold, . . .	\$2,106
Fulled cloth made, yds.,	76	Flannel, yds.,	378
Linen, do	28	Cotton and mixed, yds.,	218

Post offices, Otisco, Amber and Maple Grove.

TULLY.

Bounded on the north by Otisco and La Fayette; east by Fabius; south by Cortland county; west by Spafford and Otisco.

This town is situated at the summit between the waters that run south and north. The surface is rolling and some of it rough. The Tully limestone appears in a number of places. The soil is particularly adapted to grazing.

The total number of acres in Tully, is 16,265½.

Improved acres,	12,269½	Unimproved,	3,996
Improved acres to each inhabitant,	7.57	Cash value of farms, . .	\$662,576
Cash value of stock, . . .	\$87,515	do tools and implements,	\$23,662
Acres plowed in 1854, .	3,825	Acres, fallow,	157
do pasture do .	3,826	do meadow,	2,402½
Tons of hay,	1,797	Bushels grass seed, . . .	46½
Spring wheat, acres sown	371	Bushels harvested, . . .	4,243
Winter wheat, do	321½	do	1,424½
Oats, do	1,465	do	29,070
Barley, do	682½	do	10,715
Buckwheat, do	94½	do	1,036½
Corn, do	685½	do	20,989
Potatoes, do	97½	do	8,059
Peas, do	29½	do	487
Beans, do	4½	do	85½
Turnips, do	1½	do	94
Flax, do	20½	Pounds of lint,	4,000
Flax seed—(bushels,) . .	132½		
Hops, acres sown,	1	Pounds harvested,	6,000
Apples, bushels,	24,465	Cider, bbls.	288½
Maple sugar, lbs.,	5,945	Molasses, galls.,	81
Honey, do	2,070	Wax, lbs.,	171
Neat cattle under 1 year,	285	Neat cattle over 1 year,	458
Working oxen,	120	Cows,	1,102
Cattle killed for beef, . .	150	Butter, lbs.,	109,654
Cheese, lbs.,	30,900	Horses,	562

Swine under 6 months, .	389	Swine, over 6 months, .	874
Sheep,	2,176	Fleeces,	1,692
Wool, lbs.,	5,918½	Value of eggs sold,	\$1,554
Value of poultry sold, .	\$721	Flannel, yds.,	116
Fulled cloth made, yds.,	18	Cotton and mixed,	162
Linen do do	27		

Post offices—Tully, Vesper and Tully Valley.

FABIUS.

Bounded north by La Fayette and Pompey, east by Madison county, south by Cortland county, and west by Tully.

This town is best adapted to grazing; the south part has high hills, divided by deep valleys. The Tully limestone is seen at several points.

Total number of acres in Fabrus is,	26,778½		
Improved acres,	19,784½	Unimproved acres,	6,994½
do to each inhabitant	8.77	Cash value of farms,	\$958,355
Cash value of stock,	\$179,525	do of tools and implements,	\$35,251
Acres plowed in 1854, ..	3,762	Acres in fallow	79
Acres pasture in 1854, ..	9,635	Acres in meadow,	5,627½
Tons of hay,	5,205	Bushels grass seed	62½
Spring wheat, acres sown	431½	do harvested	4,877
Winter wheat do	178	do do	1,239
Oats, do	1,614½	do do	32,159
Barley, do	367½	do do	7,599
Buckwheat, do	55½	do do	510
Corn, do	778½	do do	25,736
Potatoes, do	150½	do do	11,162
Peas, do	111½	do do	1,924
Beans, do	2½	do do	135½
Hops, do	1½	Pounds harvested,	1,515
Flax, do	2½	do of lint,	587
Flax seed, (bush.)	13	Apples, bushels,	40,056
Cider, (bbls.)	94	Maple sugar, lbs.,	6,615
Molasses, (gals.)	746	Wine, gallons,	6
Honey, (lbs.)	3,685	Wax, lbs.,	179
Neat cattle under 1 year	357	Over one year,	790
Working oxen,	126	Cows,	2,637
Cattle killed for beef ..	105	Butter, lbs.,	148,500
Cheese, (lbs.)	527,770	Horses,	735
Swine under six months,	426	Over six months,	498
Sheep,	2,972	Fleeces,	3,336
Wool, (lbs.)	12,356½	Value of poultry sold, .	\$595
Value of eggs sold,	\$1,383	Fulled cloth made, yds.,	25
Flannel, (yds.)	238	Linen do	81
Cotton and mixed,	351		

Post offices, Fabius and Apulia.

INDIAN RESERVATION.

The Indian Reservation consists of 5,971 89-100 acres, of which there is improved 2,063½ acres. This reservation is situated on the Onondaga creek, in the towns of Onondaga and La Fayette. The south part of the tract is hilly. The soil is good, well watered, and abundantly supplied with water power. The state of cultivation is far inferior to that of the farms around, but it is improving. Many of the people live in good houses,—some of them quite elegant, having blinds well painted at the windows. The land is sufficient for the wants of the little remnant of this once powerful tribe; and the 309 people living there have brought into cultivation 6.67 acres for each person—quite as much as the average of the county—and, to say the least, the quality is as good as the average of our farming lands. Nothing but industry is necessary to make these Indians as rich as their neighbors.

In 1855, the cash value of their stock was \$6,969.75.

do do do tools was \$8,942.25.

Acres of wheat sown, 1845, 87½ acres; and in 1855, 76 acres; in 1845 they harvested 1,156 bushels of wheat.

1845—Oats, 107 acres sown, yielded 2,111 bushels.

Barley, 2½	do	do	70	do
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Buckwheat, 2½	do	do	50	do
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Corn, 189½	do	do	4,492	do
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Potatoes, 21	do	do	840	do
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Peas, 7½	do	do	91	do
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Apples, 1,798 bushels.

Meadow acres, 116½; acres plowed in 1854, 578½; fallow, nine; pasture, 126½; maple sugar, 431 lbs.; gallons molasses, 21½; neat cattle, 1845, 189. In 1855, neat cattle under one year old, 33; over one year, 108; working oxen, nine. In 1855, they had 40 cows, 42 horses, 44 sheep, and 142 swine. In 1845, butter, 1,150 lbs.; value of unenumerated farm products 1855, was \$489.

The only manufactory is bead work, of which they sold \$564 worth.

These statistics are from the census taken by the State of New York; and, as it happened, the year they represent (1854) was the most unfortunate for our farmers, in consequence of a drouth that extended through most of that part of the season necessary to the growth of crops; and this may be considered the year of minimum production of grass, hay, and all the grain crops. The yields of grain are only given, that some comparison might be instituted between the several towns. The census taken by the General Government in 1850, gives the productions of the counties, but not of the towns separately. The aggregates of the principal productions, as derived from the census of 1850 and of 1855, will now be placed side by side, that we may see how the whole county stands, at each of these dates.

ANIMALS AND THEIR PRODUCTS.

	Working oxen.	Other cattle.	Cows.	Butter. Lbs.	Cheese. Lbs.	Horses	Mules	Swine.	Sheep.	Wool. Lbs.
1850.....	3,150	22,008	21,203	2,147,518	1,004,878	13,967	.....	31,018	112,990	345,880
1855.....	2,454	27,242	24,801	2,294,287	860,644	17,330		831,539	94,202	318,446

PRINCIPAL VEGETABLE PRODUCTS.

	Wheat. Bushels	Rye. Bush.	Corn. Bushels.	Oats. Bushels.	Tobacco Lbs.	Peas and beans. Bushels.	Potatoes Bushels	Barley. Bushels	Buck- wheat Bush.	Hay. Tons.	Grass seed. Bu
1850.....	427,535	45,095	782,220	891,331	73,731	24,081	437,566	440,293	33,673	82,004	3,640
1855.....	182,206	5,340	907,453	1,015,227	654,987	43,899	380,141	371,785	32,453	63,246	3,493

A mere inspection of these tables is sufficient to show the tendency of our agriculture, making allowances, as we must, for the drouth of 1854. The plans adopted in taking a census by the General Government, and those for the State, are so unlike in many respects, that they do not enable us to draw perfect parallels. We cannot tell the acres sown in 1849, and therefore the yield per acre cannot be had. It is probable that as many acres of wheat were sown in 1854 as in 1849, but of this there is no certainty. There is probably a falling off in the number of acres of rye sown, as it has not generally proved a paying crop in this county. Corn is more generally raised, and as a crop is growing in favor; the same may be said of oats. The number of acres devoted to tobacco was vastly greater in 1854 than in 1849. The area appropriated to beans and peas is also greater. The number of cows is increasing, while that of the sheep is decreasing.

All our deductions from census returns must be received with a full knowledge that there is not yet sufficient system and care taken in gathering statistics to make the report entirely reliable. They are, at best, but approximations to the truth. More accuracy must be secured, and many more taken before we can receive their results as certain. Few farmers determine with accuracy the amount of even those crops that are measured in the half bushel—the hay is only guessed at. The most reliable returns are those that relate to the number of acres that are devoted to particular crops. A table has been calculated, and is here given, that shows the percentage of the cultivated land, that is devoted (as appears by the census of 1855,) to the leading crops, viz: Pasture, meadow, Wheat, (spring and winter,) oats, barley, corn and potatoes. The calculation has been carried to three places of decimals; and the table shows, by inspection, the comparative areas used for these crops in the several towns, and the average of the towns for the county.

TABLE showing the population of each town, the number of acres of cultivated land to each person, the percentage of the cultivated land that is devoted to pasture, meadow, wheat (Winter and Spring) oats, barley, corn, potatoes, and to all other crops aggregated. Calculated from the Census of 1855.

	Population	Improved ac's to each inhabitant.	Pasture.	Meadow.	Wheat.	Oats.	Barley.	Corn.	Potatoes.	All other crops.
Camillus.....	2,740	5.98	.266	.125	.129	.120	.086	.114	.013	.247
Cicero.....	3,388	4.24	.306	.219	.033	.145	.006	.117	.030	.141
Clay.....	3,326	5.87	.283	.237	.032	.149	.025	.111	.021	.133
DeWitt.....	2,985	5.24	.300	.203	.081	.116	.019	.121	.014	.146
Elbridge.....	4,561	3.68	.260	.154	.110	.101	.068	.118	.013	.176
Fabius.....	2,256	8.77	.487	.284	.030	.081	.018	.039	.007	.054
Geddes.....	2,066	2.31	.236	.187	.079	.160	.038	.105	.025	.176
LaFayette.....	2,340	7.69	.287	.153	.072	.167	.080	.072	.010	.159
Lysander.....	5,060	5.35	.337	.177	.078	.116	.044	.113	.015	.117
Manlius.....	6,228	3.47	.266	.163	.093	.146	.024	.118	.012	.178
Marcellus.....	2,547	6.10	.301	.173	.074	.094	.092	.090	.013	.163
Onondaga.....	5,400	6.11	.257	.164	.114	.135	.064	.097	.015	.154
Otisco.....	1,725	8.58	.329	.145	.096	.099	.113	.048	.012	.158
Pompey.....	3,770	8.60	.318	.181	.059	.120	.080	.066	.010	.157
Salina.....	2,580	2.54	.267	.215	.037	.111	.018	.012	.036	.304
Spafford.....	1,816	8.61	.340	.170	.106	.075	.122	.066	.008	.113
Skaneateles.....	3,976	5.27	.301	.200	.058	.076	.103	.090	.007	.165
Tully.....	1,619	7.37	.311	.195	.056	.119	.055	.055	.008	.201
Van Buren.....	3,085	5.60	.263	.144	.098	.138	.048	.128	.014	.167
County.....			.304	.183	.077	.120	.068	.098	.012	.151

This table shows that our agriculture is emphatically general, no one crop greatly preponderating, and taking the whole county into consideration we find that so great is the diversity of its agriculture, that fruitful seasons must find us with a supply of those products that the market most demands. The town of Camillus has the largest percentage of land devoted to the cultivation of wheat, nearly thirteen per cent. Comparing this town with the wheat growing counties of the State, we see that this is not, as with them, the leading crop. Livingston has twenty-five per cent, and Monroe has eighteen per cent devoted to this one crop. Orange is the noted grazing county, having forty-four per cent of its cultivated land in grass. Our town of Fabius is the only one in this county that exceeds this, having nearly forty-nine per cent of pasture, while the next highest town, Spafford, has ten per cent less than Orange county.

POPULATION.

In the year 1800, this county had a population of 6,434; in 1810, 25,495; in 1820, 41,467; in 1825, 48,435; in 1830, 58,973; in 1835, 60,908; in 1840, 67,911; in 1845, 70,175; in 1850, 85,890; in 1855, 86,575.

For the first three decades the increase of population was very rapid, beginning with 6,434, in thirty years it had risen to 58,973, an increase of 52,539. From this point the population advanced at a much slower rate, and in the 25 years from 1830 to 1855 it had gained but 27,602. The first increase was at the rate of 1752 nearly per annum; the last at only 1104. The first thirty years' increase was on a small population; the

next twenty-five years on a large one. The increase is now in the city. The purely agricultural town of Fabius had, in 1830, 3,070 inhabitants; in 1855 it had only 2,256. In 1830 Pompey had 4,812, in 1855, 3,770. This falling off in the rural districts has attracted some attention, and the cause has been sought after.

When the country was new, there was a large demand for labor, first to clear the forests and fence the land, then buildings were to be erected, not only to live in, but to store the crops. Roads, bridges, school houses and churches were to be brought into existence. All these things required the most active labors, not only of the farmers, but of all the mechanics they could find the means of paying. This busy population required shoemakers, tailors, merchants, in short every branch of business was quickened during this period. The winters brought no cessation of toil, the ax was in constant requisition, cutting down timber, then an incumbrance, that would now be of great price could it but have been preserved. The teams found full employment in transporting the trees thus cut down to the places where they were required. When spring came, the land was to be cleared of the logs and brush, fenced, and then planted to Indian corn. The clearing and fencing, cost from twelve to fifteen dollars per acre; if we add to this the cost of the buildings, public and private, that were constructed previous to the year 1830, we shall find that an immense capital was invested; most of which was created by the industry of the people. This once accomplished, the demand for the labor of axmen, teamsters and mechanics rapidly fell off, and thus the population began to diminish. The number of persons actually employed in the cultivation of the soil, is probably greater now than it was in 1830. It is true that the introduction of machinery for cutting grass and grain, and for saving labor in many other departments of farming, has somewhat lessened the demand for labor in the most busy periods, yet the more perfect cultivation now given the land, has probably created a demand quite equal to all that is saved by machinery.

While the country was being settled and cleared up, small villages were wanted, where the post office, two or three stores, as many taverns, blacksmith shop, &c., &c., supplied the wants of the immediate vicinity. As the roads improved, and the canals furnished facilities for reaching distant markets, these villages began to dwindle; many enterprising merchants removed to more important places, and gradually business centered at a few favored points; the most important of these in this county is the city of Syracuse. This has really been a process of adjustment of common interests for the general good. We may lament the decay of the country villages, but we cannot forget that the one great commercial center, supplies all our wants far better than they could have been provided for, had this business continued divided up. Syracuse rejoices in being surrounded by a fertile and highly productive country, teeming with well paid industry, and our farmers take pride in the prosperity of their own capital and business center, well knowing that as its population increases, so do its wants, and thus an ever growing market is in our midst.

The place of birth of the inhabitants of this county, as determined by the census of 1855, is as follows: United States, 65,126; of these there were born in

New York,.....	57,589
Connecticut,.....	2,319
Massachusetts,.....	2,020
New Jersey,.....	388
Rhode Island,	337
Pennsylvania,	267
Ohio,.....	197
Michigan,	136
The total of foreign birth is 21,449; of these there were born in	
Ireland,	9,457
Germany,	5,683
England,	3,791
Canada,	1,020
France,.....	416
Scotland,	204
Unknown,.....	500

In 1855, there were Indians resident on the reservation, 309.

CHAPTER VI.

PRACTICAL AGRICULTURE.

The agriculture of Onondaga county is based on the CLOVER plant, *Trifolium pratense*. It is used for pasture, for hay, and for manure. Strike this plant out of existence, and a revolution would follow, that would make it necessary for us to learn everything anew in regard to cultivating our lands. What their value would be without clover, we will not attempt to conjecture. We have this most valuable treasure, and appreciate it; its influence and importance to us demands an extended account.

There are two varieties of red clover, known among the farmers as the large and small. The large is but little cultivated, and is generally considered of less value for hay or pasture, and yields but a single crop of hay in a season; but where wanted for manure only, it is sometimes preferred for its heavy growth.

Clover seed is usually sown on winter wheat, in March or April, in quantities varying from two to ten quarts to the acre,—eight quarts is generally sown by the best farmers. Sometimes this seed is sown on oats, barley and spring wheat; but as it can be sown before the spring frosts are over on winter wheat, it is more certain to be covered by the freezing and thawing of the earth, and for this reason success is more certain than with any other crop.

Gypsum, at the rate of a bushel or more, is usually sown on an acre after the ground is settled, and the crop has commenced growing. Some-

times the sowing of the gypsum is deferred until the wheat is harvested, and then sown on the stubble as soon as convenient. If the season is wet, and therefore a growing one, the small kind of clover will be in full bloom before the frosts of autumn kill the plants.

It is common to pasture this young clover moderately in the fall, and opinions are somewhat divided as to whether this injures the future growth of the crop.

In the following spring, gypsum should be again sown on the clover, at the rate of a bushel to the acre. By the twenty-fifth of June, or the first of July, the small variety is ready for making into hay, and should yield a ton and a half to the acre. Various opinions have been entertained as to the proper stage for cutting this hay crop; but the general practice is to cut when in full bloom, or as soon as the earliest heads show signs of ripening. The process of curing varies with the weather and different farmers; the general plan, however, is to handle as little as possible, and to cure mostly in the cock. As soon as the hay is drawn away, gypsum, at the rate of a bushel to the acre, should be sown. By about the first of October, the second crop will be ready to cut for seed. This crop should be allowed to ripen so that the seeds are full and mostly hardened. Some time is generally necessary, at this season of the year to perfectly cure this crop; unless it is well cured and dry, it will heat in the mow to the injury of the seed. In the following winter, the seed is thrashed out at a cost of about one dollar a bushel. The straw and chaff is eaten with avidity by cattle and sheep, and is of considerable value for forage—perhaps enough to pay for cutting, curing, and putting the crop in the barn. The seed generally averages three bushels to the acre—sometimes six bushels have been saved—and sometimes the crop of seed is a failure. The usual market price is about six dollars a bushel.

After the seed crop is removed from the ground, there is a considerable part of the crop of hay left, particularly if it was cut high, as it should be. This stubble is usually pastured to some extent.

In the spring following, the ground is plowed, unless wanted for pasture. If plowed, corn, oats, barley or spring wheat is sown, and a good crop is confidently expected. If it is intended that the clover shall remain on the ground more than one year, other seeds are sown with the wheat so as to make a more perfect covering of grass, and aid in filling the soil with roots. Timothy, Herd's grass, *Phleum pratense*, sown in September with the wheat, will aid in every part of the cultivation of the clover. The crop of hay will be benefited, and the surface of the ground will be more perfectly covered, and thus weeds kept out, and in case the second year is to be for pasture, it is important.

According to BOUSSINGAULT, one acre of the perfectly dry roots of clover will equal twelve and three-fourths ewt. This is manure for the next crop, and the same may be said of the tops that are plowed under. The roots run deep into the soil, and thus pulverize it, so that a single perfect plowing brings it into a most satisfactory condition. Some of our best farmers plow their fields deep once in a few years, and then shallower plow-

ing of this clover sod will show the long tap roots, that have been pulled up from the subsoil by the plow, projecting above the surface all over the field, looking quite like dead weeds. These roots have transferred the fertilizing matters of the lower soil to the surface.

If our soils require improving we turn the clover crop under, and repeat the operation until there is sufficient fertility to allow us to carry the clover off. The oftener we can fill the soil with roots, and then plow them under, and thus allow them to rot, the sooner we expect to get our land in condition to crop with grain.

A very considerable part of the cultivated land of this county has never had any other manuring than this clover and gypsum, and its fertility is not diminishing. Fields that are distant from barn yard manure are rarely treated to anything but gypsum and clover. These fields are not cropped with grain as often as those that have the benefit of barn-yard manure, but they are manured at much less expense.

The cost of a fourth of a bushel of clover seed at \$6 is,.....	\$1 50
do sowing is about	8
do 3 bushels of gypsum at the mills is,	24
do drawing same,	12
do sowing at three different times,	38

Total cost of manuring one acre,	<u>\$2 32</u>
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A field treated as described, having the first year given a crop of hay and another of seed; the second year, an acre will nearly or quite pasture a cow from the twentieth day of May until the middle of August. If then plowed six or eight inches deep in the most perfect manner, it will be in the best possible condition for winter wheat, or if not wanted for wheat, the land may be used the second year for pasture the whole season, and put into corn or any other crop the next. Clover is a biennial, and two years is all that one seeding should stand.

Prof. Emmons in his report, gives analyses of red clover cut before the development of the blossoms, and of hay cut when ripe.

The young clover had of water,.....	80.31
Dry matter,	19.69
Ash,	0.40
Ash calculated dry,.....	2.03

Analysis of the ash of Young Clover.

	Per centum.	Removed in a ton of hay, lbs.
Silica,.....	0.981	0.446
Phosphates,	30.245	13.459
Carbonate of lime,.....	7.642	4.400
Magnesia,.....	2.285	1.015
Potash,.....	33.688	14.991
Soda,	7.164	3.147
Chlorine,	3.642	1.620

	Per centum.	Removed in a ton of hay, lbs.
Sulphuric acid,	6.723	2.991
Carbonic acid,	5.744	2.556
	<u>98.114</u>	<u>44.625</u>

Clover hay (cut when ripe).

100 grains of the sun-dried clover, lost in the water bath,	12.73
And gave ash,	5.56

Analysis of the stems and leaves, or the whole plant.

	Per centum.	Removed in a ton of hay, lbs.
Silica,	0.850	1.054
Phosphates,	20.600	25.544
Carbonate of lime,	30.950	38.378
Magnesia,	3.930	4.873
Potash,	25.930	32.153
Soda,	14.915	18.394
Chlorine,	1.845	2.288
Sulphuric acid,	0.495	0.624
	<u>99.515</u>	<u>123.308</u>

Analysis of the upper part of the stem, with the superior leaves and heads.

	Per centum.	Removed in a ton. Pounds.
Silica,	0.810	1.003
Phosphates,	21.900	27.156
Carbonate of lime,	32.333	39.969
Magnesia,	0.200	2.480
Potash,	27.940	34.645
Soda,	6.753	8.374
Chlorine,	3.780	4.563
Sulphuric acid,	3.366	4.174
	<u>98.682</u>	<u>122.364</u>

"The two preceding analyses were of the ash as formed from well-dried hay, quite ripe, which grew in Bethlehem, the soil of which is often sandy upon a basis of Albany clay." Prof. Emmons' Report, 1848, page 87.

These analyses of Prof. Emmons are given, with a view to throw light upon the action of the red clover plant upon the soil; its value as a crop for feeding farm stock will be readily determined by reference to the Transactions of our Society, for the year 1856,—article entitled "NUTRITIVE AND FATTENING QUALITIES OF GRASSES," page 245. J. Thomas Way, consulting chemist to the Royal Agricultural Society of England, being the authority relied upon in the article. Full analyses of what Mr. Way calls the natural grasses, and the artificial grasses, will there be found.

For the purposes now in hand, it is only necessary to compare that of red clover with the most esteemed "natural" grass, that is extensively cultivated by our farmers, viz: *Phleum pratense*, known by the various common names, "Meadow cat's-tail," "Timothy," and "Heard's grass."

Analysis of 100 parts of plants as taken from the field.	Water.	Albuminous or flesh forming principle.	Fatty matters.	Heat producing principles, starch, gum, sugar, &c.	Woody fiber.	Mineral matter or ash.	Date of collection.
<i>Phleum pratense</i> (Herd's grass),.....	57.21	4.86	1.50	22.85	11.32	2.26	June 13.
<i>Trifolium pratense</i> (Red clover),.....	81.01	4.27	.69	8.45	3.76	1.82	June 7.

The same plants after being dried at 212° of Fahrenheit, until all the moisture was expelled, gave the results that now follow, viz.:

	Albuminous or flesh forming principle.	Fatty matters.	Heat producing principles, starch, gum, sugar, &c.	Woody fiber.	Mineral matter or ash.
<i>Phleum pratense</i> ,	11.36	3.55	53.35	26.46	5.28
<i>Trifolium pratense</i> ,.....	22.55	3.67	44.47	19.75	9.56

These results of Prof. Way are quite in accordance with the opinions of our farmers, which opinions have grown out of their experiences. *We sell our heard's grass and feed our clover.* The reasons are, the city buyers will pay more per ton for the heard's grass than they will for the clover, and we long ago come to think the clover worth quite as much as the heard's grass to feed. The objection that has been made to our making the clover plant take the position in our agriculture that the root crop occupies in that of the English farmer is, that in time we shall destroy our lands by this constant cropping without the application of foreign manures. But this system of manuring with clover and gypsum only, has been carried on for sixty years, apparently without any injurious effects. In 1849, the lamented Prof. Norton made the analysis that follows, of the soil and underlying rock of a field on the gypseous shales that had then been under constant cultivation for fifty years, without any other manure. Wheat, corn, barley, oats, hay and pasture had constantly been taken from the soil for that period of time.

Soluble in water.

	Soil.	Rock.
Organic matter,	5.18 per ct.	3.74 per ct.
Lime,	0.04	....
Magnesia,.....	0.17	1.58
Potash and soda,.....	0.68	2.32
Chlorine,	0.05	0.46
Sulphuric acid,.....	0.17	....

Soluble in Muriatic acid.

Lime,	0.26	6.75
Magnesia,.....	0.15	9.43
Alumina,	6.78	2.79
Peroxide of iron with phosphoric acid, ...	4.60	4.03
Phosphoric acid,	0.44	0.34
Sulphuric acid,	0.07	....

	Soil.	Rock.
Soluble Silica,	trace	....
Carbonic acid, .....	....	13.72
<i>Insoluble in acid.</i>		
Lime,	0.05	1.13
Magnesia,	0.14	0.75
Alumina and iron,	29.89	19.25
Silica,	50.73	83.21
	<u>99.40</u>	<u>99.50</u>
<i>Both soils calculated free from water.</i>		
Soluble in water,	0.92	1.13
“ “ acid,	41.01	12.35
Insoluble residue,	54.04	81.30

WHEAT.

Previous to the year 1846, Onondaga county produced wheat of the best quality, and in such quantities that it was the great staple, and the crop from which the farmers expected to realize their profits. In that year the midge destroyed the crop; so entire was the destruction, that of seventy acres on the writer's farm, that on the first day of June gave promise of an abundant yield, not one bushel was harvested. Before this year, this insect had done some injury, but it was so slight as hardly to attract notice. In the fall of 1846, but little wheat was sown, and most of what was sown was Mediterranean, a variety then very little esteemed, but it escaped the midge and gave us good flour, though not as white as we were accustomed to. At once this wheat was in demand for seed, and its cultivation became general, though many less acres were sown than before the midge came. This was due in part to the low price paid for Mediterranean wheat, and partly to the fact that we had begun to learn that a single crop did not pay as well as many crops on the same farm. Some attempts were made to raise the old and most esteemed varieties of wheat in the year that followed, and sometimes with success, but gradually these attempts became less and less frequent, and now only in some favored localities where the soil is quick and warm, or on some windy hill top do we succeed with any but this one kind. Gradually the Mediterranean wheat has improved on our natural wheat soils, until the flour is perhaps equal in quality to the old red chaff. If the miller does not try to make too much flour from a given quantity, he can make the first quality. Since the troubles experienced from the midge, much more spring wheat is raised than formerly. The high lands south of the Helderberg rocks are particularly adapted to spring wheat. Spafford raised in 1854, 1419 acres of spring wheat, and only 253 of winter wheat, while Camillus raised of winter 2085½ and of spring 31½. The farmers of these two towns know from experience what is best for them, and it is proven that here in Camillus on the shales of the salt group, winter wheat should be grown, while spring wheat is better suited to the upper measures of the Hamilton group and the Genesee slates

of Spafford. We cannot reverse this state of things without loss to both towns.

While our lands were new and incumbered with stumps, summer fallowing for wheat was very common. This was then necessary, as only by repeated plowings could we destroy the grass and weeds. As the stumps disappeared, we fallowed less. Now wheat is raised by plowing barley or oat stubble once, doing the work well. Where there are neither stumps nor stones in the way, and the land has been deeply plowed for the spring crop, this one plowing is found to answer quite well. Before the land is plowed, it is best to turn on the stubble as many animals as can be had, to pick up the grain that has been left. If the weather is wet, a harrow run over the stubble, will cause the scattered grains to germinate. If this can be accomplished, a thorough plowing will destroy them, and there will be but little to trouble the wheat. A second plowing would bring the stubble again on the surface, unless it was deferred until it was decayed, and this would generally take more time than can be had, and sow the wheat in season. But where there is time to plow shallow, immediately after the oat or barley crop is off, and then allow the stubble to decay, a second plowing will prove of advantage.

Clover sod, handsomely turned over in August, is very commonly sown to wheat. Occasionally a piece of land that has become weedy, is still summer fallowed.

Before the wheat is sown, the ground is well leveled with a harrow, and if lumpy, it is rolled. The most approved method of sowing is with a drill; and, in case the land is exposed to winds, the drill should move at right angles to the course of the prevailing winds, that the plants may be sheltered by the ridges that the drill will cast up between the rows. The severe winds of winter, if the ground is not covered with snow, often destroy wheat that is covered with a harrow, while that sown by a drill will live through. Another advantage of drilling wheat, is the protection the ridges give to the plants in the spring frosts—when ground that is not well drained will “heave,” and thus elevating a crust of soil on the surface, tear and break the roots, and in many instances kill the wheat. In drilled wheat fields, the space between the rows will often rise in this way without disturbing the plants,—they being in rows, the cracks in the frozen surface will be alongside, and not lift them.

After the clover seed has been sown, and the ground is sufficiently settled to allow the use of teams, a roller should pass over the field. This will settle down the ridges, and level off the surface, for the convenient passage of the reaper in harvest, and will aid in covering the clover seed.

Well rotted barn-yard manure, applied in small quantities on the soil after it has been plowed, and before harrowing, especially on tops of knolls and on exposed side-hills, will abundantly pay the cost, and almost insure a good crop. Our farmers generally sow two bushels of wheat on an acre, and generally put it in with a drill.

There has been much speculation in regard to the capacity of our soil to

produce wheat as abundantly as formerly. If the census report of 1855 was to be taken as evidence, it certainly would show that it could no longer be raised with profit. The General Government is to take a census which will give the results of 1859, and then we shall have a fruitful year to compare with the unfortunate year, 1854; neither will be correct, nor will the mean of the two be reliable,—for 1854 was by far the most unfortunate year for wheat that we have known, if we except the one marked by the devastations of the midge. The wheat crop of this county, at least the winter wheat, probably averaged in 1859, not less than twenty-five bushels to the acre. Some crops averaged forty, and many fields from twenty-eight to thirty-five. Riding over the county during the harvest, not a field was seen, that, to an experienced eye, did not promise more than twenty bushels to the acre. The crop of 1858 was a good one. A ten acre field produced that year 410 bushels. The year 1857 gave a fair crop. These three years came up fully to the average of the crops before the midge appeared. If it was certain that the crops of twenty years ago, in quantity and variety, could be raised, we should not sow the large areas we then did, for there are other crops that pay a better profit. The price of wheat now varies from one dollar to a dollar and a half—rarely it reaches two dollars a bushel. The cost of raising an acre where the crop is twenty bushels to the acre—and this good farming will secure as an average, in ordinary seasons—will be,

Dr.

For plowing once,	\$1 50
Harrowing and rolling,	50
Drilling,	31
Seed, two bushels, at 10s.,	2 50
Harvesting,	2 00
Threshing,	2 50
	<hr/>
	\$9 31

Cr.

Twenty bushels at 10s.,	\$25 00
Straw,	2 00
	<hr/>
	\$27 00

Profit, \$17.69.

The foregoing estimate is for a crop of wheat that requires only one plowing, and supposes the land to be in a high condition, and is to be taken as the minimum of cost, and the yield as only averaged by our best farmers on our best wheat land. Wheat is liable to many uncertainties, and the failure of a single crop cuts down the average of many good yields. A winter of constant deep snow kills the crop. A winter without any or very little snow, by exposing the plants to severe frosts, sometimes nearly destroys Mediterranean wheat. If these dangers are escaped, many cold

nights in the month of April, with warm days, will heave out the crop on wet land. Mildew or rust, on the very eve of what had promised to be an abundant harvest, will nearly destroy every hope, sometimes. Frequent warm rains in harvest will cause the berry to sprout, and nearly destroy its value. These uncertainties, with the depredations of the armies of injurious insects, are to be taken into the account when we talk of average crops. He will be a fortunate farmer that, once in six or seven years, does not have a nearly total failure of a crop, that is in no wise to be attributed to an unproductive soil.

To guard against the uncertainties and dangers that are incident to the wheat crop, the only thing known to our farmers, that avails them, is perfect cultivation of land in high condition, and the use of those varieties that ripen early.

INDIAN CORN, OR MAIZE.

Indian corn, as a crop, is constantly increasing in favor with our farmers. The census of 1850 reports 782,220 bushels, and that of 1855, 907,458 bushels harvested. This shows a great increase in bushels—the difference in the area planted is probably still greater, as the drouth of 1854 must have placed the acreable product below 1849.

Many different varieties of maize are planted in this county. The smaller and earlier being generally raised on the elevated lands of the south part of the county, while larger kinds are matured in the northern and lower parts. The warm, wet seasons are most favorable to the production of this crop. The months of July and August, if warm, and there are seasonable showers, will generally insure a good crop, though the rest of the season is not so favorable. The land should be well drained, and in high condition for maize. A clover sod, well filled with roots, turned over about the first of May, rolled and perfectly harrowed, is the most desirable preparation for the crop. Our most successful farmers plant from the first to the fifteenth of that month. It has been shown by experiment that to produce large crops the hills should be near together; but this increases the labor attending the whole process of cultivation and harvesting. Generally we mark the ground both ways, with a marker drawn by a horse, so that planting the hills at the crossings of the marks they will stand in squares of three and a half feet. Six or seven grains are put in the hill and covered with a hoe—the dropping and covering being done by hand. If the ground is properly prepared, a man will plant two acres in a day. Various machines have been made to facilitate this operation, but thus far they have not gone into general use. It is important that the rows should be sufficiently accurate and straight to allow the cultivator to go both ways of the field. A machine that will plant regular rows both ways is wanted. The seed should be covered about one and a half inch deep with mellow soil, which, if dry, should be well pressed down with the hoe. As soon as the plants are fairly above the ground, a half gill of gypsum is placed on each hill by hand, and as soon as the rows are sufficiently plain, a one

horse cultivator is run between the rows both ways of the field. The crop is dressed with a hand hoe, all weeds and grass being carefully removed; this cultivating and hoeing is usually done twice, but in very clean land it is often not necessary to use the hoe but once; but the cultivator should, at short intervals, go through the field until the crop is so far advanced that the horse and cultivator begin to injure the plants. This cultivating will be over with by the last of June. Nothing more is now to be done until the ears are nearly ripe—which will usually be in the fore part of September—when the stalks are cut near the ground and compactly set up in stooks of about twenty-five hills each, and carefully bound near the top, and again lower down. To do this will cost a day's work to the acre. In this condition the grain stands until sufficiently cured to husk and crib. This will be about a month after it is cut up.

A man will husk, bind the stalks in bundles, stook them, and load into a wagon, about thirty bushels of ears in a day, of good corn. The drawing and cribbing is but a small expense, but will depend somewhat on the distance the field is from the cribs; one cent per bushel will pay. About January, this grain will be ready to shell and carry to market, if it is to be consumed immediately. If the grain is to be put in large masses, it must remain in the crib until spring, to cure fully. The stalks are of great value for forage, and are fed to horses, cattle and sheep, and are considered as of as much value as equal weights of hay, for cows giving milk.

The cost of an acre of corn is as follows:

Plowing and harrowing,	\$2 00
Rolling and marking,	50
Planting, 4s.; and seed corn, $\frac{1}{4}$ bushel, 2s.,	75
Cultivating, hoeing first time and plastering,	2 00
do second time,	1 00
do cutting up and stooking,	1 00
Husking 100 bushels of ears,	3 00
Drawing and cribbing,	1 00
Thrashing,	1 25
	<hr/>
	\$12 50

This makes \$12.50 as the cost of an acre of corn, which should yield fifty bushels. The price is rarely one dollar a bushel, and it is as rarely as low as fifty cents; perhaps the average is half way between—say seventy-five cents.

This gives, as the value of an acre,	\$37 50
The stalks are worth not less than	5 00
	<hr/>
Giving, as the total value per acre, the sum of,	\$42 50
The cost being deducted,	12 50
	<hr/>
There is left, for the use of an acre,	\$30 00

By this calculation, the corn costs twenty-five cents a bushel ; no charge being made for manure, or anything but seed and the labor actually laid out.

The average of the corn crop is not fifty bushels to the acre, if we take the whole that is planted ; but our best farmers make this average.

There is no certainty in regard to crops. When we do all we can to secure an abundant yield, we sometimes fail ; but we have as few failures with this crop, to say the least, as with any of our staples.

The insects most destructive to corn, are CUT-WORMS, the larvæ of different species of *Argotis*. Doctor Fitch, in his reports, has described the five varieties, and expresses the opinion (p. 311), that neither the fertility of the soil, or the kind of manures which are applied, have any influence on these worms, "except in making the plants grow more succulent." He says, "we all know these worms are common in our highly manured gardens ;" and he adds that he has found them "plenty," on one occasion, among beans planted upon a hill-side, on ground so barren that it was thought nothing else could be raised there. In the year 1857, the Cut-worm did great injury to corn in this county, that was planted on sod land ; while those fields that had previously had the grass roots destroyed by cultivation, were very little injured. Few of our farmers are willing to put corn on land that the previous year was used for other grain ; and thus most of our corn suffered. It was remarked that land in high condition was most unfortunate, and our best farmers suffered more than some of their neighbors. It is worthy of notice, that at the time of planting corn, no Cut-worms were seen, and they did not appear until about the time the corn was large enough to receive the gypsum dressing. The following year, 1858, the Cut-worm was seen in great numbers at planting, but did the crop very little injury. In 1857, the weather had been cold, up to about the tenth day of May ; in 1858, the latter part of April was warm, and the worms were probably past doing much harm, when the corn came up. To avoid the Cut-worms, late planting is perhaps advisable. If they appear, to the injury of the crop, the only known remedy is to attack them, as Dr. Fitch says, "dig the worms from their retreats and destroy them." A new enemy to young corn has appeared here within a few years, the *Sphenophorus venatus* of Say, or the Hunter weevil. This insect eats the leaves of the young plant, and in some cases it has materially injured the crop. This new acquaintance may prove a formidable enemy.

OATS.

The number of bushels reported by the census of 1850, as raised in 1849, in this country, is 891,331 ; in 1854, 1,015,227 ; and it appears that in 1854 twelve per cent of all our improved land was devoted to this crop. Oats are usually raised on corn stubble, by one plowing, and sufficient harrowing to bring the surface into good condition. The yield per acre varies from thirty-five to one hundred bushels. Fifty bushels is common, and is perhaps averaged by our best farmers. The cost of raising the crop is about as follows :

Plowing and harrowing one acre,.....	\$2 00
Sowing and covering,	31
Seed, 2½ bushels, at \$0.50,.....	1 25
Harvesting,	2 00
Threshing 50 bushels, at 4 cts.,.....	2 00
	<hr/>
	\$7 56
Fifty bushels at the average price, 40 cts., will be	
worth	\$20 00
The straw is worth	2 00
	<hr/>
Total value of the products of an acre,.....	22 00
	<hr/>
Leaving for use of land,.....	\$14 44
	<hr/>

There are but few failures to get a fair yield of this crop, and it is growing in favor. Late sowed oats sometimes suffer from rust, especially on the low grounds of the northern part of the county. The best time to sow is from the middle of April to the first of May.

It is not intended by the writer to say, that the wheat, corn and oats raised in this county, are produced at the profit given in these estimates by any but our best farmers. There are farmers whose crops fall far below the averages given, and who expend more labor in the cultivation—not because there is any real necessity for so doing, but because their poor farming is necessarily expensive. The land must first be put in good condition; this costs time and labor, but once done, the whole business of farming becomes pleasant, and reasonably profitable.

BARLEY.

This was until lately an important crop in this county. In 1849 we produced 440,293 bushels, which was 136,340 more than was produced in any other county in this State. In 1854 the production had fallen off to 371,785 bushels, and it has been growing less and less every year since. Formerly we expected forty bushels to the acre, now we cannot rely on more than twenty. This falling off is principally due to the depredations of an insect, thus described by Doctor Fitch, in the Journal of our Society of April, 1859.

“These are small insects, little over the tenth of an inch in length, the shape of their bodies having considerable resemblance to that of a wasp. They pertain to the order *Hymenoptera* and the family *Chalcididæ*, and are the only insects of this family yet discovered which feed on vegetation; all the other species whose history is known, being parasites of other insects, feeding upon them internally, mostly when in their larvæ state and thus destroying them. European naturalists, therefore, will scarcely credit us, when we say these barley and wheat flies are enemies, and not friends. But so much evidence has now accumulated upon this subject, that we can no longer doubt as to their true character. They are much more nearly related to the genus *Pteromalus* than to the genus *Eurytoma*, to which

Dr. Harris referred them. Still, they may differ from other insects of the genus *Pteromalus*, and should very likely constitute a new genus. But until I have an opportunity to give the species of this most intricate group a more thorough revision, I am unprepared to decide as to their true generic location.

"The BLACK-LEGGED, or Massachusetts BARLEY-FLY (*Pteromalus? hordei*, Harris) is black, its feet and knees pale dull yellow, its *anterior shanks* of the same *dusky* or blackish color with the middle and hind ones.

"The JOINT WORM FLY (which I propose to name *Pteromalus? tritici*) is black, its feet and knees and its *anterior shanks* *pale dull yellow*, its neck with a dull white spot on each side.

"The YELLOW-LEGGED, or New York BARLEY-FLY *Pteromalus? ful-tipes*) is black, its *legs bright tawny yellow*, its feet whitish, its neck with a small dull white dot on each side."

This insect attacks the crop just before the heads appear, laying its eggs in the straw; the stalk is either entirely destroyed, or if any grain is matured it is small and imperfect. When the crop is thrashed, small pieces of straw are seen, having enlarged places in which the cells and larvæ of the insect are found. Unless some relief is found we must entirely discontinue raising this crop, and henceforth barley will hardly appear in our census reports. Winter barley cannot yet be said to have had a trial here, but from reports that have reached us we have strong hopes of its being raised with success.

RYE.

This grain has been cultivated to a very limited extent here. In 1849 the crop was 45,095 bushels; in 1854 it had fallen to 5,340. Our lands are too productive in other grains to make this crop profitable. More bushels of Mediterranean wheat can be raised in most of the county on an acre, than of rye, and this settles the question, the cost of raising the crops being about the same per acre.

POTATOES.

But little more than one per cent of our cultivated land is devoted to this crop, and few farmers raise more than their own consumption requires, except in the towns near Syracuse. Salina has three and six-tenths per cent of this crop, and Geddes two and five-tenths per cent. From one to two hundred bushels is raised on an acre, rarely three hundred. The rot in wet seasons has proved destructive, and the crop is considered as very uncertain.

ORCHARD PRODUCTS.

More attention is being devoted to raising fruit, and most of our farmers are planting orchards of all the choice varieties that succeed well here. Apples are exported to the eastern markets in large quantities. The apple has generally been successful, until within the last few years, we have suffered partial failures; the year 1859, however, came nearly or quite up to former years. Pears do well here, and will be extensively cultivated. The plum

and cherry no longer produce well. Insects have nearly driven these fruits from among us. Extensive nurseries of fruit trees are cultivated near Syracuse, the trees find a ready sale, and the demand is increasing. One of our principal nurserymen gives the following estimate of the number of acres now used for raising fruit trees, viz.: in the town of Geddes, 75 acres; Salina 260; city of Syracuse 65; in the town of Onondaga 20; in other towns 80; making for the whole county about 500 acres.

MEADOWS AND PASTURES.

Over thirty per cent of our improved lands are devoted to pasture, and over eighteen per cent to meadow. Red clover, *Trifolium pratense*, Timothy grass, *phleum pratensis*, and red-top, *Agrostis vulgaris*, are sown and cultivated for pasture and hay. It is very rare that any other grass seeds are sown, but we find in most of our pastures and meadows that have stood a few years, White clover, *Trifolium repens*; Spear grass, Kentucky blue grass, *Poa pratensis* and *P. compressa*; Orchard grass, *Dactylis glomerata*; Meadow fox-tail grass, *Alopecurus pratensis* and *A. geniculatus*; Red-top, *Agrostis vulgaris*; and Quack grass, *Triticum repens*. Many other, but less abundant varieties might be found in old fields, but these are the important plants on which our cattle feed, summer and winter.

The last mentioned Quack or Couch grass, is commonly regarded by our farmers as a foul weed. Once in land that does not admit of perfect cultivation this grass is eradicated with difficulty, but it is eaten readily, and even with avidity in the pasture, and if cut green makes good hay. Lands that are intended for permanent pastures are of very little, if any less value for having this grass in them. Its tenacity of life is a recommendation in some localities. Good farming will, in ordinary seasons, secure not less than two tons of hay from an acre of meadow, at a cost, in cutting, curing and drawing into the barn, of about \$1.25 per ton. The general calculation for grazing districts, such as the town of Fabius, is an acre of meadow and two acres of pasture to support each horse, and each head of neat cattle or eight sheep, on the farm. In fact, Fabius has $1\frac{2}{3}$ acres of meadow for each animal, and $1\frac{3}{4}$ acre of pasture; of both pasture and meadow, 3.03 acres are required for each animal.

TEASEL. *DIPSACUS FULLONUM*, or *Fuller's Teasel*.—The cultivation of the Fuller's Teasel, was introduced into this county about twenty years since, by Chester Moses, of Marcellus, and soon after into the town of Skaneateles by John Snook, and has been cultivated in these towns to a considerable extent ever since. In 1858, about 500,000 lbs. were raised. Teasels are sown in rows or drills three feet and four or six inches apart, from the first of April to the first of May, as the weather will permit. The seed comes up in from fourteen to twenty-one days,—the plants are thinned at the second hoeing. All weeds must be kept down, and three hoeings are necessary. Clayey land, suitable for wheat is best for this crop; land that heaves by the spring frosts is unsuitable, and sandy soils do not answer. The ground should be made fertile by previous good cultivation; but it is not well to manure the crop itself, as by so doing, the plants suffer by what

is called the "black spot," the growth being too rapid. Corn land that would produce fifty bushels to the acre, without manure, would be about right, as to condition. The land should be protected from northwest winds. The first season's cultivation is confined to planting, thinning, keeping the weeds out, and the ground mellow. When winter comes the leaves are six or eight inches long. The more snowy the winter is, the better. Sometimes temporary fences are run across the field to cause the formation of snow banks, where it is feared that the ground may be bare. Sometimes the ground is slightly covered with straw for protection during winter by the Connecticut growers. As soon as it is dry enough to allow of cultivation the next spring, it is loosened, and every weed is cut down. In about three weeks after this dressing another will be necessary; by this time the plants will have become so strong as to cover the ground, and the center shoot with the teasel will appear. The cultivation must cease when the plants become so thick as to endanger their being broken. The blossoms, which are white, commence in a circle around the middle of the teasel and extend upwards to the top of the bur, then they begin to go downwards until the whole has blossomed—the blossoms drop in the order of their appearance. Lateral branches are thrown out at a later period, producing burs of a quality more valuable than the first and center bur, which is called a "king." A healthy, fine plant will yield from twenty-five to one hundred burs. When the blossoms have all fallen from a bur it is time to cut it off, leaving three or four inches of the stalk. The kings are cut first, as they ripen first. The side burs, called "queens," ripen and are cut later. The cutting begins about the tenth day of August, and must be performed by hand. A small knife is used, and the burs are dropped into a basket holding one and a half or two bushels, and carried to the curing house. This house should have doors to ventilate freely. Shelves, made of strips of boards, so as to give a free passage to the air, are used, on which the burs are spread about six inches deep. If the weather is damp it may be necessary to turn them, which can be done with a fork. If the weather is good, the curing will be complete in two weeks. Unless the burs are sorted when cut, it will be necessary to do this before they are packed for market. The kings make one sort, the queens another, and the small burs make the third—the very small burs, being of no use, are not cut.

The kings are used in manufacturing coarse cloth, the queens on cloth of medium quality, and the small burs are used on the finest cloth. The teasles are carried to market in boxes made of thin boards, usually three feet four inches wide and deep, and six feet long. The teasles are sold by the pound, at from five to fifteen cents; the average price is about seven and a half cents, where they are raised. The crop varies from one to two thousand pounds per acre, averaging about fifteen hundred. At fifteen hundred pounds, and seven and a half cents, the acre brings \$112.50. The last five years the average price has been as high as ten cents a pound, which gives \$150.00 per acre.

Cost of cultivating an acre is about as follows :

Plowing, harrowing and marking,	\$3 00
Sowing, \$0.25; rolling, to cover seed, \$0.50,	75
Cultivating, hoeing and thinning, first time,	5 00
do second time,	5 00
do third time,	3 00
do second year,	5 00
Cutting and placing on shelves,	18 00
Curing and boxing (six boxes required to the acre),	9 00
	<hr/>
	\$48 75
	<hr/>

Say for all the expenses of an acre, \$50.00.

This crop is an excellent one to precede wheat, as the plants have tap roots, and one plowing will put the ground in fine order. White beans are sometimes raised the first year between the rows; and, by so doing, all the expenses of that year are often paid. The teasel seed costs a mere nothing, and is of some value for feeding sheep. Hens do not like it.

Although the teasel is a biennial, in case the first year's cultivation is poor, and the plants are too thick, they will not mature the second year, but can be carried over, and made to head the third year.

There is only a limited demand for teasels, and any great increase in the crop is sure to reduce the price.



The Tobacco Plant in full Blossom.

TOBACCO. *Nicotiana*.—

“Named after John Nicot, ambassador from France to Portugal, in 1560, who introduced the abominable weed into Europe.” So says Torrey.

The cultivation of Tobacco, as a crop, was commenced in this county in 1845, by Chester Moses and Nahum Grimes, both of the town of Marcellus. They joined in hiring a man from Connecticut, who was skilled in the culture. In 1846, Col. Mars Nearing, then of the town of Salina, raised ten acres; and very soon others engaged, in a small way, in raising this crop. By the census of 1855, it appears that in the preceding year there were raised, in the whole county, 471½ acres, yielding

554,987 pounds; which gives, as the average yield, 1,178 pounds to the acre. It is thought that this crop pays a better profit, on suitable ground,

when skilfully handled, than any other raised here. Expensive buildings are first necessary ; then high manuring, careful and laborious cultivation, accompanied with skill, and a sacrifice of manure for other crops—unless it can be purchased—are to be taken into the account by any person who intends to enter on its cultivation. In the immediate vicinity of manure that can be purchased, this crop is increasing ; perhaps it is in other places, but what the effects may be on the profits of other crops, there has not been sufficient time to determine since the introduction of what is now a staple. Mr. Benjamin Clark, of Marcellus, who is perhaps better acquainted with the facts in regard to the culture of tobacco than any other man here, estimates the production of 1859, as of the value of \$150,000 ; of which he estimates Marcellus as producing \$25,000 worth ; Skaneateles, \$10,000 ; Van Buren, \$20,000 ; Lysander, \$10,000 ; Manlius, \$8,000 ; Camillus, \$5,000 ; Geddes, \$4,000 ; Salina. \$8,000 ; Elbridge, \$6,000 ; Onondaga, \$8,000, and the residue divided among the other towns.

From Mr. Clark, the following facts and estimates in regard to this crop are derived :

A warm, rich, well drained, and mellow soil should be had, and then twenty-five loads of rotten barn-yard manure should be put on an acre. The land being in high condition, this amount of manure will be consumed by a crop. The plants should be set about the first of June, three feet four inches, by two feet to two feet six inches apart. To raise the plants, the fall before pulverize the bed fine, and mix with the soil hog or some other manure that has no foul seeds in it. Sow seeds on the well raked bed, as soon the ground can be properly prepared in the spring, about one ounce to a square rod, equally distributed all over the bed. Roll hard with a hand roller, but do not cover the seed. Glass should be kept over the bed until the plants appear, which will be in two or three weeks ; after they are up and started, the glass will be required only at night and in cold days. The bed should be kept moist and free from weeds. When the plants are three inches high they are large enough to set. To prepare the land, the manure should be applied as early as the ground is dry enough to plow. The last of May plow and harrow again, so as to mix the manure



The Plant and root as should be set.

[A. TRANS.]

well with the soil. Mark the land one way for rows, three feet four inches. Make hills by hauling up a few hoes full of dirt and press it well with the hoe. In taking the plants from the bed take care to keep the roots wet. Unless the ground is quite damp, put a pint of water on each hill half an hour before setting. Make a hole, put in the root, and press the dirt close to it, all the way to the lower end. If any plant does not live, take care to set another. Unless the earth is wet, or at least moist, water the plants soon after setting as may be

necessary. In about one week cultivate and hoe. In ten or fourteen days repeat the operation, and continue to cultivate so as to keep the weeds down. The tobacco worms may appear about the second hoeing; *kill them as fast as they show themselves.* When the blossoms appear, break off the stalk, leaving about fifteen leaves, taking off about seven leaves.



The plant as set in the hill.



A plant ready to top, place for topping indicated by b.



Plant after topping.

After topping, break off all the suckers. In about another week, go over again, breaking off suckers and killing worms. In another week repeat the operation.

By this time the crop is ready to begin the harvest. This may be known by the suckers which start at every leaf, and when they have all appeared



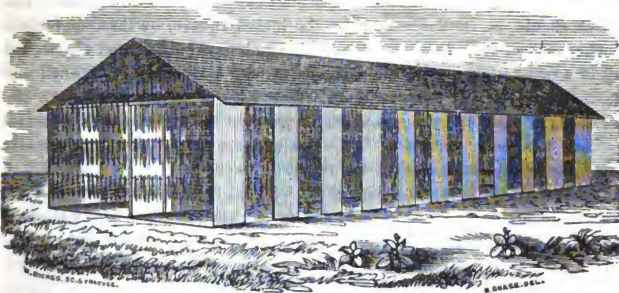
Plant with the suckers growing.

down to the lower leaf, the plant is ready to cut, every sucker having been removed as it appeared. The stalks are cut at the root. In a warm day cut in the morning and evening. In the middle of a hot day, the leaves will burn before they are wilted. The best way is to cut in the afternoon and lay on the ground to wilt. This wilting forwards the process of curing, and so toughens the plant as to make it practicable to hang it without much loss in breaking leaves.

After wilting draw to the house, which should be twenty-four feet wide, fifteen feet high, so as to have three tiers, one above the other. A building of this width and height, thirty-five feet long, will store an acre, or one ton of tobacco. The girts on the side of the building should be five feet apart; a row of posts through the middle is necessary to put girts in, to hold the poles that the plants are tied to. The best poles are made of basswood sawed one and one-half by four inches, and twelve feet long.

The plants are handed to a man who, standing on a moveable platform m

made by a light plank, receives them, and beginning at the top tier he winds a piece of prepared twine around a stalk, fastening the first plant to the pole;



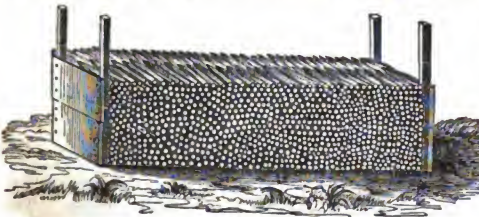
Tobacco House without side doors, end boarding, and end doors, to show the manner of hanging the Tobacco.

the second plant is placed on the other side of the pole, and a single turn is made around the stalk; then again the third stalk is put on the same side of the first, the twine passed around, and the next on the other side, and so on to the end of the pole, where the twine is made fast. About thirty or thirty-six are hung on a pole, one-half on each side. If this twine gives way it is manifest that they will all be let loose. The poles are put on the girts about fourteen inches apart. In this way the whole building is filled. Skill is now demanded to regulate the ventilation until the crop is cured, which is determined by examining the stem in the leaf, which should be hard, up to the main stalk. Then in



Hanging Tobacco on the poles.

damp weather the tobacco can be taken down and laid in piles, with the tips together to keep it from drying, and to secure this, cover over with boards. The next thing is the removal of the leaves from the stalks, taking this time to separate the broken leaves from the unbroken ones. They



Tobacco stacked after stripping.

This preserves the moisture. The pile should be kept covered with boards,

are then made into parcels of 16 or 18, called "hands," and are fastened by winding a leaf around them. Pile these hands tips on tips, the square ends out.

and the sides also covered, leaving the wound ends of the hands exposed to the air. If everything up to this point has been skillfully done, in four or five days the tobacco will be fit to pack in cases, and take to market. The cases should be of pine, two feet six inches square, by three feet eight inches, and of inch lumber. Place the hands tips on tips, and the wound ends against the ends of the box, press with a lever or screw until 400 pounds is in, then fasten on the top. The tobacco now goes through the sweating process, and will lose about ten per cent in weight before fit for use.

This tobacco is known in the market as "seed leaf," and is principally used for wrappers for cigars; the refuse is exported. A crop handled in the manner described, and with skill, will sell in New York city, at from twelve to fifteen cents a pound; but from want of proper care and skill, the crop of this county does not bring an average price of over eight cents.

Cost of Crop.

The plants are worth per acre,	\$2 50
Manure, 10 cords, say.....	20 00
Fitting ground and marking,	4 50
Planting and setting,	5 00
Cultivating and first hoeing,	2 00
do second hoeing,	1 50
Topping, and killing worms, say	1 00
Suckering, first and second times,	2 00
do third time,	4 00
Harvesting and hanging (four men and team one day),	6 00
Stripping one ton,	10 00
Five packing boxes,	5 00
Labor of packing,	1 50
Twine, for hanging,	1 00
	<hr/>
	\$66 00

A ton, at $13\frac{1}{2}$ cents, is worth \$270; deduct 10 per cent for shrinkage, and $1\frac{1}{4}$ cents per pound for transportation and commissions, in all \$52.00, leaves \$218.00 as net proceeds. The cost being taken from this, \$66.00, and we have \$152.00 for use of land and buildings.

This is the best statement that can fairly be made for this crop. If the price be put at the average our growers get, viz., eight cents per pound, we have for the crop, 1,800 pounds, after shrinking, \$144. Deduct \$66 for cost, and \$22.50 for commissions and transportation, in all \$88.50, which deducted from the amount received, leaves \$55.50, as the ordinary profit per acre.

ROTATION OF CROPS, AND MANURES.

From the account already given of our principal crops, the rotation has been so far indicated that little remains to be said on the subject. The most common and approved rotation is:

First year.—Clover sod, plowed in the spring, and planted to Indian corn.

Second year.—Oats or barley.

Third year.—Winter wheat, sown on the stubble of the oats or barley ; timothy grass seed, at the rate of four or six quarts to the acre being sown, either with a machine attached to the drill, or by hand ; if by hand, immediately after the wheat is covered. In the following spring, red clover seed, at the rate of eight quarts per acre.

Fourth year.—A crop of hay, and another for seed.

Fifth year.—Pasture.

In the south parts of the county, spring wheat is sown extensively, and the rotation differs somewhat from that given. Much more land is there devoted to grazing, consequently there is less plowing and re-seeding for grass. The rotation given is the most common, in all parts of the county where grain is extensively raised.

Formerly our barn-yard manure was generally applied to the corn crop, being drawn fresh from the yard, and spread over the surface before plowing. This is not now so generally done, the objections to this mode being the cost of handling and plowing under this bulky, unrotted mass. Most of our farmers who raise grain, distribute their straw, in the form of bedding for their stock, under the sheds, in the stables and over the yards, during the winter—the stock eating what they will as it is carried out ; the corn stalks are fed with more care, but the parts not eaten mingle with the straw, and during the winter become wet by the rains and snows. As soon as the frost is out of the yard in the spring, everything should be piled up compactly, and in the most convenient form. The tops of the piles should be flat, to hold the rain. Spread gypsum over the whole surface, so that no stench will be perceptible. Some attention to this matter may be necessary as fermentation progresses ; with proper care, the gypsum will prevent offensive odors from rising. During the winter, a free use of gypsum in the stables, will keep them sweet and pleasant. After cleaning out, spread a little of the dust over the floors, and throw a little on the pile of manure, as it grows in bulk from day to day.

The contents of the yards having been properly piled in the spring, they will be ready to be turned by July, and will then demand attention. By the time the ground is plowed for wheat, the process of decay will have gone so far that the manure can be drawn to the field and spread from the wagon on the furrows ; the harrow will then mix it with the surface soil, and the drill can be used without serious trouble from straws clogging the spouts. A light dressing of this nearly rotted manure, will produce a very decided effect on the crop of wheat, as well as on the grass and clover that are to follow. If the wheat crop does not require manuring, grass lands are dressed later in the season, and the effect is most satisfactory. This mode of handling manure is less costly than the methods formerly pursued, and the results are more satisfactory.

By stimulating a strong growth of clover and grass, we prepare the ground for the corn and oats that are to come next. This is a well settled

point among our best farmers, and most of them would prefer a good clover sod of two years' standing, that had been well manured in the manner described, with the wheat crop, to turn over for corn, than to trust that crop on land that had only received the green contents of the yards spread before plowing, and then buried six or eight inches deep where the roots would not find it until the fate of the crop had been nearly decided by a backward growth in the cold weather of May and June. There may be some loss in spreading barn-yard manure on the surface of a meadow or pasture in the fall, and it may be that the greatest possible effects of manure are to be secured by taking it directly from the stable to the field and plowing under very shallow, and then after it has rotted some, plow again deep, and thus sandwich it between two furrow slices. In this way everything might be saved, but at what cost?

The farmers of this county rely on their yards, with clover and gypsum, to keep up the fertility of their lands. A few of them use muck, and near the salt works, the ashes and pannings are used. Very few use anything but gypsum and manure of their own production, and whatever census reports may say, the fact is patent and known to us all, that our lands are increasing in fertility, and the average of our crops is greater now than it was twenty years ago. Extensive inquiries made during the year 1859, of our farmers did not show a case where this was not confidently asserted, and a glance around showed, in confirmation of the truth of the assertion, green fields, fat cattle, good fences, well painted, tasty and convenient houses, and new barns, made necessary to store increasing crops. The truth is, elegance and luxury such as exists among the farmers here, could only be purchased and sustained by skill in cultivating our lands, rich as they are by nature, and that skill they have, and with it constant improvement is the result. Deep plowing and draining such lands as require it, is becoming general, and care is applied to every branch of farming. Foul weeds are more perfectly eradicated; everything shows advance among us.

FARM STOCK.

The early settlers of this county brought with them from New England such neat cattle as were then common. The first of the improved breeds known here were two imported cows that, in 1803 or thereabouts, were purchased by Timothy Sweet, of the town of Pompey, of Doctor Mordecai Hale, of New York city, he having purchased from Mr. Livingston of Dutchess county. These cows undoubtedly were of the best of the Short Horn stock of that day. One came to the county in calf, which proved to be a male. Mr. Sweet paid \$500 for this cow and calf, an enormous sum for that day. The other cow, though equally good when she started, was injured on the passage, and it was supposed that her chances for recovery were very few, thus she was sold for \$60. She did entirely recover, and these two cows were bred to this calf, and their descendants with each other until 1836. The mother of the bull was red and he was the same color, the other cow was spotted. These cows were excellent milkers, and

there are persons now living who assert that the mother of the bull has given forty quarts of milk in a day. This stock has been always known as the "Sweet breed." In 1830, David Ely purchased a full blood Durham bull, out of "Fortunatus" imported by Gorham Parsons, of Boston, and bred by George Falkner on the river Tees; the dam of Ely's bull was Rosebud, bred by John Watson of East Windsor, Conn. She was full blood, sired by Fortunatus; her dam was Flora, out of Denton, who was imported. This bull of Mr. Ely was crossed on the Sweet cattle, and now the descendants of these two families make up a large portion of the cattle of Pompey and adjoining towns, but this is by no means the limit of the usefulness of these valuable animals. In 1816, or thereabouts, Thos. Gould of Pittsfield, Mass., purchased of Reuben Murrey, a Sweet bull for \$100. He was shown at the Massachusetts shows, and extensively used, and had some influence in founding the "*Red cattle*" of New England. The bull purchased with his mother by Mr. Sweet, was sold in 1808, he being then five years old, to Israel Chapin, of Canandaigua, N. Y., for \$350, and there he founded the family known as the "Norton breed." In 1834, James L. Monier, of Naples, Ontario county, bought, of Reuben Murrey, a bull-calf for \$100. He was used as a stock getter in that county. In 1820, Anson Sweet took a cow and bull calf to near Antwerp, Jefferson county, and in 1828, Milton Lord took a cow and bull to Livingston county; thus these cattle were extensively bred from in various places, and have had much influence in improving the more common cattle of the country. Later, John Sanford of Marcellus brought Durham blood into that town. Harvey Baldwin, of Syracuse, purchased at Mr. Bullock's sale some twenty years since several excellent Durham cows. The Van Rensselaer stock was introduced about that time into Skaneateles by Silas Gaylord and William Fuller. Capt. De Cast of that town imported Durhams and Alderneys. Ayrshires and Devons have also been introduced in considerable numbers, so that now it would be difficult to find any considerable herd of cows that had not a strong infusion of the blood of the improved breeds.

This county has recently carried off leading prizes at the State shows of Buffalo, Watertown and Syracuse, awarded to animals of the best breeds.

Of horses we have a great variety. Many years since Mr. Ely introduced two thorough-bred sons of the famous Eclipse into the eastern part of the county, and Mr. Thorn another into the western part. From these horses have been bred many fine animals. A son of Sir Henry, the competitor of Eclipse in the famous race, has many descendants here; and more recently Col. John Burnet, of Syracuse, has kept at his stables the imported Consternation, well known as the winner of the first prizes in our Society. These horses, and others, such as Messenger and Duroc, have given us a strong infusion of the blood of the English race horse.

Mr. John Legg, of Skaneateles, nearly twenty years since, imported from Canada two very fine horses of the Norman blood, and they were extensively used as stock horses. Cleveland bays, and the still larger English dray horses, have been crossed on the common stock to some extent. Gen.

Gifford, and other Morgans, have been owned here, and we have now many descendants of the famous Black Hawk. These breeds have been mixed and crossed as the varying fancy of each owner of a brood mare might for the moment dictate, so that we have no "breed," though many good animals, some of them quite good enough to meet the views of a connoisseur in horse flesh.

The sheep of this county are generally kept for their wool, though a few mutton sheep of the Southdown, Bakewell, and like breeds, are raised. Formerly our wool growers had large flocks of Saxony sheep,* but the price for very fine wool not being satisfactory, gradually these flocks have been crossed with the Merinos, and at this time the favorite breed is what is called the "Vermont Merino." We have some French Merinos, and many crosses between the two families, and some of our wool growers prefer a dash of French blood to give size.

Recently large numbers of these sheep have been bought for Texas and other southern States. In 1858 this county was awarded most of the first prizes for Merinos and Saxonys.

Swine are not extensively raised here. The farmer generally contents himself with raising his own pork, and sells but little. We have had all the improved breeds, and just now the Suffolk is quite a favorite.

It is no part of the purpose of this report to give a treatise on the best manner of raising and handling the various animals that we raise and use on our farms; it is, perhaps, sufficient to say, that most of them are well housed in winter, and tolerably well fed all the year; but it may not be out of place to give some estimate as to the cost and profit, if there be any, of raising stock.

We have seen that in Fabius, which is a grazing town, if we add the whole number of neat cattle that are under one year old, and over one year, to the oxen, cows and horses, and then assume that eight sheep require the same ground as one cow, and add this one-eighth of the total number of sheep to the rest, we have a number which, divided into the acres of pasture gives us 1.91-100 acre for each, and of meadow 1.12-100 acre, in all 3.03-100 acres of land as necessary to support a cow, horse (young or old), or eight sheep. The town of Tully requires less (2.22-100 acres), because Tully has a larger percentage of land devoted to grain, and thus has the pasture the grain fields yield, and their straw and corn stalks for winter feed; thus the actual quantity of land required is more nearly derived from the statistics of Fabius than any other town. Assuming three acres as necessary, we make the estimate that follows:

A steer at three years old has consumed the equal of the products of nine acres of land for one year. This land, at \$50 per acre, should give an

* General John C. Ellis, many years since deceased, was a public benefactor, and should be remembered with honor, as the man who introduced the Merinos of the early importations, at great cost to himself. The blood he paid for is still here. David Ely is entitled to like honorable mention for his services in the introduction of the best of Saxony blood; he is yet on the stage of action, though no longer a resident of this county.

annual rent of not less than \$4 per acre ; this gives for use of land, 4+9, =\$36. The care and labor is worth not less than half this sum (\$18 ;) thus the actual cost of the animal, at three years old, is not less than \$54. The days required are 1,095, and the cost per day is nearly five cents.

The sagacity of the farmers of our grazing districts has led them into more profitable business than even raising their own cows. They can buy them cheaper. Fabius, with 2,637 cows, made 143,500 lbs. of butter, and 527,770 lbs. of cheese. If we take the ordinary calculation as correct, that their butter brings twenty cents per lb., and cheese eight cents per lb., we have for each cow \$10.88 worth of butter, and \$16 of cheese—in all \$26.88. One-half is usually allowed for labor, leaving for use of land \$13.22, or \$4.41 for use of each acre. These figures are taken from the census report of the unfortunate year 1854, and the products of cows in butter and cheese were unusually small, giving for each cow only 54.4 lbs. of butter and 200 lbs. of cheese. The farmers of Fabius would be very unwilling to take this as an average ; the calculation is only made here to show that they are correct in not raising cattle to sell while they can do so much better in dairying.

In that part of the county best adapted to the cultivation of grain, our farmers generally intend to keep stock enough to manufacture their hay, cornstalks and straw, into manure. The necessary teams to do their work they must have, and cows enough to make their own butter, and, perhaps, a small surplus to sell ; the rest is generally made up with sheep, as the most convenient stock to handle, with the least labor. They calculate that eight Merino sheep can be kept as easily as a cow on the farm, and with far less labor. A good ewe should yield four and a half pounds of wool, worth forty-five cents per pound, which, for the eight, gives \$16.20 ; and the eight should raise six lambs, worth in the fall \$2 each ; in all \$12, which, with the wool, gives \$28.20. We could not profitably devote all our lands, that are good for grain, to raising sheep ; but we can connect them in proper numbers with grain-raising to advantage. We think to more advantage than any other farm stock.

To show the advantage of raising some stock, in connection with grain, we have only to take Camillus, which is a grain-raising town, and we find that only 1.15 acre is devoted to pasture, and 0.54 to meadow, for each head of neat cattle, of horses, and of eight sheep. This gives for pasture and meadows 1.69 acre each head. From this it is evident that the straw and cornstalks of Camillus, winter about half our stock, and that the pasture we get from our grain fields nearly half pastures them. If we could carry this calculation fully out, the comparison would be still more striking, between purely grazing and the mixed agriculture. The town of Camillus has a large number of horses engaged in other business than farming, the canal running through the town, and being near Syracuse, a considerable part of our hay is sold there.

In closing this account of the practical agriculture of Onondaga county, it is proper to state the difficulties and hindrances that lessen our profits,

and make our business uncertain. Under the head of climate, and in treating of the several staples, many of them have been alluded to; but the great and overshadowing obstacle in our way, is the ever present armies of insects destructive to every crop we raise. Our fruit trees have their enemies—our grasses have theirs—the wheat and barley have theirs; the cut-worms, sometimes, destroy a crop of corn, and even the oats suffer from their enemies—and within a few years the common grasshopper has become formidable, and is increasing in numbers at a rapid rate. If it were not for the destructive insects, we might dismiss every fear growing out of cold, or wet, or dry seasons, or early or late frosts, or even that thing so dreaded by theorists, the deterioration of the soil. There is no one thing we so much require now, as a knowledge of the habits of the whole of these tribes; and the State cannot help us more than by keeping that most useful and learned man, Dr. Fitch, constantly employed, in the hope that his labors will result in finding the proper remedies with which to protect our crops.

The prices here for farm laborers are from \$12 to \$16 per month, from the first day of April to the first day of November, besides board. By the year, from \$12 to \$13, or \$14, besides board. Some of our farmers build small cottages, and hire men having families, who live in them and board themselves, and work by the month or day. If, by the day, the wages are, from April 1st to July 1st, 88½ cents per day; for July, \$1; for August, \$1.25; for September and October, 88 cents; from November 1st to April 1st, 75 cents. In bad weather, no employment is given.

Female labor is usually \$1.25 per week, but a woman skilled in making butter and cheese will command \$1.50 or \$2 per week.

CHAPTER VII.

PRINCIPAL MANUFACTURING ESTABLISHMENTS.

Blacksmiths' shops.....	53	Band and belting factories....	1
Furnaces.....	11	Cheese box do	1
Machine shops.....	9	Marble do	2
Iron railing shops.....	1	Drug and medicine do	1
Cooper do	38	Dyeing establishments.....	1
Turning do	4	Boat building do	5
Cabinet do	15	House do do	3
Coach and wagon shops.....	45	Stair do do	6
Carpenter do	12	Stone cutting do	8
Boot and shoe do	53	Ice do	1
Tailor do	10	Undertaker's do	1
Butcher do	7	House furn'g do	3
Harness, &c. do	26	Carding & cloth dressing estab't	2
Potteries.....	2	Asheries.....	3
Tanneries.....	19	Bakeries.....	1

Daguerreotype.....	3	Breweries.....	5
Piano	1	Chandeliers and soap factories..	2
Hat and cap shops.....	4	Confectioneries	1
Milliner shops.....	1	Distilleries.....	5
Brick yards.	9	Salt manufactories.....	190
Saddle and coach hardware....	3	Saleratus do	1
Printing offices.....	5	Silver-ware do	3
Dentistry	2	Tin and sheet iron manufac's..	17
Whip factory.....	1	Wire seive do	1
Woolen, cloth and yarn factory	6	Vinegar do	2
Agricultural implements do	16	Car do	1
Water-lime mills.....	12	Box do	1
Paper do	6	Pattern do	2
Straw paper do	1	Stave do	5
Oil do	1	Chair do	4
Feed do	1	Tobacco and cigar do	5
Grist do	36	Lime do	8
Pearl barley do	1	Looking glass do	1
Heading do	4	Gas do	1
Planing do	2	Sash and blind do	4
Saw do	81	Stone-cutter's tools do	1
Plaster do	12	Gunsmith do	2
Spoke factories.....	1	Wooden ware do	1
Wheelbarrow factories.....	1	Window shade do	1
Scale do	1	Cotton do	1

The foregoing incomplete account of manufacturing establishments, is compiled from the census of 1855. It is only given here because there are no means of arriving at any better statement of this branch of our industry; but it is by no means to be taken as a perfectly correct view of our manufacturing; may the next census give us a better one.

BUILDINGS AND FENCES.

The census of 1855 gives the total value of the dwellings in the county of Onondaga as \$11,622,549. Of this amount \$6,228,627 belongs to the city of Syracuse, leaving for the dwellings in the several towns \$5,393,922.

This statement is all we have in regard to the value of dwellings, and the subject is only referred to (in the hope of calling attention to it in such a way), that when our next census is taken, we may have reliable information in regard to the amount of capital invested in barns, buildings used for farm purposes, for manufacturing establishments, fences, &c., as well as the number of dwellings in each of the villages.

In the absence of any means at present of determining these, it only remains to us to give some description of the general mode of building which is in vogue among the farmers of Onondaga.

The first settlers constructed their dwellings of logs, but these soon disappeared, and were succeeded by a better class of houses made of wood,

brick or stone. The type of the old fashioned country house, borrowed from our New England ancestry, was a front of about forty-five feet, facing the road, with five windows in the upper story, and four, with a door, in the lower. This door opened into a wide, cheerless-looking, hall, with large square rooms on either hand. A wing, or extension to the rear, usually contained the kitchen and the woodhouse. Then came a fanciful style of architecture, characterised by many gables, valleys in the roof, low, hot chambers, and ornaments pendant from the cornices, making the whole edifice expensive, uncomfortable, and wanting in durability.

This gaudy folly governed taste here but a short time, and has given place to a much improved style of farm house, having a hipped roof, no gables, and few windows. This house approaches the square form, has a wide projecting roof, and the least possible surface exposed to the action of the weather.

The farmers of Onondaga go to great expense in constructing barns and stables for the storing of their crops, and the protection of their farm stock.

When the country was new, and farms were just redeemed from the forest, rails were almost universally used for fences, and are so still in the northern part of the county, where cedar abounds, but along the line of the outcrop of the Helderberg range, stone is extensively quarried for that purpose, while in the southern towns post and board fences are more common.

MEANS OF EDUCATION.

The means of education in Onondaga are amply provided, and it is unnecessary to go beyond our limits for instruction, unless the advantages of a university are required.

Academies were established soon after the settlement of the towns of Onondaga and Pompey, that are still in active usefulness. There has, for many years, been a well sustained academy in Manlius. In 1839, Mr. Nathan Munro founded the MUNRO COLLEGIATE INSTITUTE, at Elbridge, endowing it with \$20,000. It is now in successful operation, having a very fine building, that will accommodate three hundred pupils. The village of Jordan, in the same town, has an academy. These institutions are ample for all our wants, standing, as they do, on a common school system that reaches every family, and gives facilities for acquiring a good English education to every child in the county.

The census of 1855, gives the following statistics of common schools of the city of Syracuse, and several towns in the county :

City of Syracuse, has school houses,.....	16,	scholars,	9,334
Camillus, districts,	10,	do	1,023
Cicero, do	15,	do	1,305
Clay, do	21,	do	1,536
De Witt, do	14,	do	1,089
Elbridge, do	16,	do	1,625
Fabius, do	18,	do	872

Geddes,	districts,	3,	do	638
La Fayette,	do	12,	do	783
Lysander,	do	22,	do	1,838
Manlius,	do	20,	do	2,283
Marcellus,	do	13,	do	1,858
Onondaga,	do	28,	do	1,990
Otisco,	do	12,	do	641
Pompey,	do	25,	do	1,463
Skaneateles,	do	17,	do	1,484
Spafford,	do	9,	do	659
Tully,	do	7,	do	633
Van Buren,	do	16,	do	1,174
Total,		294		31,428

The number of scholars given is the whole number entitled to instruction in the public schools, and entitled to draw money from the public funds for the support of the schools. There are many private and select schools not enumerated in the Census report. The city of Syracuse has a system of free schools that is thought to be equal in merit to any known, and to be conducted in every way to the satisfaction of the people. The important features will now be given :

All the schools are under the control of a Board of Education, consisting of eight commissioners, one from each ward of the city, one-half being elected each year, all serving without pay. Annually the board elects, a chief executive officer called a superintendent, who gives his time exclusively to the care of the schools. The schools are thoroughly graded, and embrace, primary, junior, senior and higher departments. The course of study embraces the whole range from the elements to an extended academic course. The classes are taught so as to prepare pupils for college, and the English and mathematical studies embrace nearly the entire college course. During one term in the High school, each year, a normal class is formed, and the pupils are thoroughly drilled in the elements of education and the philosophy of teaching. The theories of instruction presented to the normal class are enforced by practice, as each of the members are required to enter one of the public schools and teach several weeks under the direct supervision of an experienced teacher. In this way the schools are constantly supplied with thoroughly qualified teachers. The distinguishing feature of the schools is the thoroughness of the instruction, and the graduates of the High school, will compare favorably with those of any institution of similar grade.

Special attention is paid to the other departments. The governing rule being to make the foundation sure, great care is taken in the selection of teachers for the primary departments, and higher salaries have been paid them than were paid in the higher departments, to secure the best possible teaching talent where it was thought to be most important. A series of

experiments in regard to the nature of the instruction best adapted to these schools, has resulted in incorporating into the primary course of instruction, specific moral lessons, physical exercise, and lessons derived from tangible objects, generally known as "object lessons." Pupils thus have their powers of observation specially cultivated by continual reference to the objects of sense, that everywhere surround them, instead of being dulled and deadened by the abstractions taught in the schools of the past age.

Within the past two years the subject of phonetics has received considerable attention, and it now forms an integral part of primary instruction. The result of the introduction of phonetics has been to secure a greater distinctness of articulation, and a greater facility of acquiring both spelling and reading than was ever before attained in the schools. The brogues and peculiarities represented in the schools have given place to an uniform excellence in pronunciation which was before considered unattainable.

The number of teachers employed now is 69, five of them males and 64 females. The greatest attendance last year was 5,258, and the average was 2,496. The entire cost of schools per year, exclusive of buildings, is about \$28,000, of which \$18,000 is raised by tax, the other \$10,000 being received from the public funds.

NEW YORK ASYLUM FOR IDIOTS.

In 1851 the State of New York started this institution as an experimental school in Albany. It was finally established on a permanent basis by erecting a commodious and well proportioned building in the town of Geddes, but very near the boundary line of the city of Syracuse. The site of the building is a little more than a mile from the center of the city in a southwest direction. The grounds consist of eighteen acres, purchased for the use of the asylum mainly through the liberality of the citizens of Syracuse. The trustees have leased some thirty-five additional acres, making in all a farm of fifty-five acres. The western and highest part of the ground is wood-land, the remainder descending with a fine slope to the south-east, terminates in a terrace of about four acres in extent, upon which the building stands. The site is sixty feet above the general level of the plain of the city. Thus the whole city is overlooked, the highlands of the south-east part of the county constituting the back-ground of a delightful landscape.

The soil is made of disintegrated gypseous shales and the debris of the vermicular limestone, and is of the first quality. There is a fine orchard of fruit trees on the premises, and the efficient superintendent has availed himself of every advantage to make the land productive, and thus aid in the support of the institution. From the results he has obtained it would seem that a farm was a necessary adjunct, and the same skill and industry on the part of the management perhaps, would prove this true of most public institutions of charity.

It furnishes a great variety of labor, some of the simplest kind that can

be engaged in with a moderate degree of strength or intelligence, and other requiring a good deal of judgment and dexterity. This exactly meets the wants of most charitable institutions.

The institution, which has given occasion for these remarks, now produces all the vegetables consumed by its family of one hundred and seventy; the hay, grain and root crops, used in the stable, are likewise, in the main, produced by the labor of the inmates. A list of the various crops are added. Hay, 19½ tons; corn and oats cut for fodder, four tons; Potatoes, 591 bushels; corn, 224 bushels; carrots, 338 bushels; turnips, 226 bushels; beets, 102 bushels; tomatoes, 73 bushels; parsnips, 17 bushels; salsify, three bushels; onions, six bushels; cucumbers, five bushels; peppers, one and a half bushels; spinach, 15 bushels; peas, 15½ bushels; beans, 11 bushels; cabbages, 600 heads; cauliflower, 100 heads; pumpkins, ten loads; squashes, 2,500 lbs.; strawberries, 250 quarts; currants, 160 quarts. Besides these articles, a profusion of celery, lettuce, radishes and asparagus.

This notice of the asylum has been introduced, not only to call attention to one of the earliest and largest of the institutions devoted to this charity in the country, but to show that the leading idea in its management is to give an industrial education to its inmates. At least, whenever practicable, the aim is to develop the intelligence of the pupils to that degree, that they may receive such an education elsewhere, if it is not acquired at the asylum. To this end, all the instruction, all the management and training, has a practical tendency. This not only ensures, it is found, the highest comfort and enjoyment of the pupils, exposed to such influences; but when they leave the institution has an effect to relieve their families or society from the burden of their support. They are trained, if possible, to produce as much as they consume.

For eight months in the year, all the older boys spend a part of the day in labor on the farm or in the garden. The remaining months of the year they are employed in some simple mechanical employment.

This institution was organized by, and has continued under the direction of Doctor Hervey B. Wilbur, and to his enlightened and untiring industry its great success is due. Its objects commend it to the lively sympathies of all philanthropists; but in a paper like this, it would be out of place to dwell largely on a topic of this kind. We can only say that we have strong faith in its practical utility in ameliorating the condition of that most unfortunate class of persons for whose benefit it was established.

CONCLUSION.

All that now remains to be considered are the means resorted to by the Onondaga farmers to improve themselves in their ability to conduct their business. The establishment of agricultural periodicals marks the era when inquiry, and, as a consequence, improvement commenced. As soon as we began to discuss and investigate in regard to the best modes for us to adopt in cultivating our lands, we saw the necessity of wide inquiry,

reaching not only into the practices of the most successful farmers, but into the reasons of those practices. From the silence that had so long marked our proceedings, suddenly great numbers demanded answers to difficult questions, or were ready to give replies, as best they could, in regard to the principles that should be observed. Soon it was apparent that the practical man, however wise he might be, had not sufficient time at his command to solve the multitude of intricate problems, the solution of which he felt was important; he must call to his aid the student and man of science. This has been done, and now scientific men are demanding facts upon which to base their reasoning, and practical men are as willing to give these facts, so far as they can determine them, as the student is to use them. But how are these facts to be determined? It might have been supposed easy to learn the facts of a business in which most of the world has been engaged since civilization had an abiding place, but such a supposition would have been unfounded; uncertainty attends all we do; and it will be long before either the practical or scientific men will agree among themselves in regard to some of the commonest processes of agriculture. The student sees the earth constantly bearing crops that carry off minerals that careful analysis finds in the most minute quantities, or not at all, in the soil, and he predicts ruin in the future. The practical man, more hopeful, goes on cropping, restoring to the soil only the least valuable part of the plants he cultivates, watching every indication of the necessity of a change; groping his way in the twilight of agricultural science, longing for its meridian sunshine.

This spirit of inquiry begat agricultural societies and fairs, the great use of which is, the facility they furnish for comparison of opinions and results. Meetings for free discussion have been found of great advantage, and many of them have been held in this county. Three times the State Society has held its fairs here, and for many years we have had a strong county society, and now we have, in addition, the Farmers' Clubs of Skaneateles and Manlius, and another in connection with some of the adjoining territory of Cayuga county, for the town of Lysander. A general disposition to impart and to receive information has called these agencies into existence, and the increasing wealth of the farmers enables them to sustain them.

To the State Society we first direct our inquiries, and now that we see going into operation a State school, under favorable auspices, whose origin we trace to the society, we are looking forward most hopefully for a day of increased knowledge, and, as a consequence, prosperity.

CORRESPONDENCE.

SOME GLIMPSES OF AGRICULTURE IN GREAT BRITAIN.

[By LUTHER H. TUCKER of "The Country Gentleman," and Treasurer of the Society.]

I. One scarcely needs to be reminded, now, of the grounds on which the agriculture of Great Britain is worthy of especial regard in other countries. It may possibly be considered an evidence that a more general progress is beginning to work its way among ourselves, if there is a more general interest taken in progress elsewhere achieved; it is at least certain, I think, that American farmers are less inclined than heretofore to receive with doubt the traveler's reports, and more eager to sift from them every detail which has a practical bearing, and every principle that can be put into general application. In devoting several months, during the past season, to obtaining such glimpses as I could of the systems of farming pursued in England and Scotland, I met several Germans traveling with a similar end more or less directly in view; coming sometimes from parts of Europe where it might be supposed that every foot of land had already been made productive, they still appeared to think that there was something for them to learn from such farmers as Norfolk and the Lothians can boast; and it is probable that every nation of civilized *eaters* has had its deputies among the producers of these and other British counties within the past ten years, either transient visitors, or often young men spending a protracted period as farm pupils, in order to acquire more perfectly the routine of management in the field and at the farmstead. France has perhaps been particularly earnest in manifesting a desire to avail herself of Anglican improvements in multiplying the resources of human life, in the destruction of which the two nations have so often shown a bitter rivalry; and the reports of such men as De Gourey, Lavergne and others, are by no means entirely divested of their interest on this side of the Atlantic.

It is not then the American cultivator alone who looks to the British Islands for instruction and examples. Their agriculture presents but an additional instance of that truth which characterizes the course of nearly every other art and of civilization itself; development more than ordinarily conspicuous has not been attained, as we might anticipate if we were to regard labor exclusively as a curse upon the race, in climates and countries where man could support himself with the least exertion, and where, at first sight, every influence would be thought most likely to elevate his condition, because most likely to promote his undertakings and to render plain and easy his onward path. On the contrary, the edict that "by the

sweat of his brow" he should live, has seemed sometimes to carry with it a divinely appointed reward. History affords numerous examples, to which agriculture forms no exception, of those efforts against difficulties and obstacles through which nature has been constantly coming under his complete subjection, and which in some measure afford the more conclusive and direct encouragement, the more he is surrounded by circumstances necessitating the active exercise of the mind and arousing him to earnest and persevering determination.

2. Nor is it more a matter of necessity to recall all those particulars, with regard to the country under consideration, which might be quoted as tending to place her present agricultural pre-eminence almost in the light of an anomaly. Neither from natural advantages, nor from the character of her population, could she have afforded much promise of it to the rest of Europe, at any time between the age of the Cæsars and that of the Normans. The great Roman commander found her natives subsisting mostly upon roots and berries, when Roman proprietors were consulting those works on the tilling of the earth, in which the scholar discovers the rudiments of nearly all that we now definitely know and practice of rural art—enfolded, it is true, in the midst of errors that have not yet themselves entirely passed away from among men. Irrigation is thought to have been going on in Italy, while the Saxons were overrunning and devastating whatever of agricultural improvement the arms of the mistress of the world had carried across the British channel, (Loudon.) The planting of the crown lands, and the encouragement extended to better cultivation by his subjects, which are ascribed to Charlemagne in the ninth century, were prototypes of the efforts in a similar direction of the present Emperor of France; but the Agriculture of France and England was then, and probably for many centuries later, in a position quite the reverse, with respect to relative advancement, of that it occupies in our day. The visitor to Great Britain from even the northernmost ports of this country, finds the course of his vessel still a northwardly one; and it is not until he has actually attained the parallel of those chilling fogs that overhang the Newfoundland banks, and of southern Labrador, bleak and almost continually ice-bound, that he lands at length in the home dominions of her majesty the Queen. If misty or dripping skies perchance have followed him in the voyage, he discovers that the extreme rigors of the latitude are there tempered by currents from regions more favored by the sun; and when he learns, on the one hand, that Indian corn can seldom be matured, and sees the peach, the melon and the tomato, requiring the protection of glass, or ripened by artificial heat, he is also told that there is no month in the circle of the year when the plowman and his teams are not actively at work. Perhaps anticipating in Great Britain a wealth of prevalent fertility, like that which characterizes some of his own virgin soils, he ascertains that comparatively little of her area might be rated in any other country as really very good, while one-thirteenth part of it still resists every attempt at cultivation, and two-thirds of the remainder are so stubborn and ungrateful as to try the

industry and ingenuity of the cultivator less, (Lavergne.) But he must be a careless observer if he should not in the end conclude that the English farmer has learnt from long experience to make every advantage of his position work with him to the utmost, and to neutralize as far as possible the disadvantages it presents. And this grand, general lesson is by no means one of the least important which English agriculture should teach the farmer of other lands; he must make it a study, whatever his latitude or locality, *to turn every circumstance about him*, as Arthur Young says the English have turned their climate, "*to the best account.*"

3. The truth, I think, is this—English agriculture has grown with the growth of the country, with the development of its means of inter-communication, and with its rapid strides in population and wealth. It is this general growth, at least, that we must undoubtedly assign as the preliminary source of the progress of its agriculture—a source which would probably be more strikingly apparent to us, if, in our own advancing career as a nation, we were not sometimes inclined to forget that we have never secured a monopoly of national aggrandizement, and that all the progressive changes which mark the past century have by no means been confined to the continent of Columbus and Washington. If we have subdued new territories, and built new cities, they have there been constantly extending the capacities, and adding to the resources of the old. London, in 1801, contained about 950,000 souls, in 1851 two millions and a half, and now, perhaps, fully three millions. The returns of the registrar-general for the three months included in the very time of my visit, show a *daily increase* in the number of mouths to feed—the natural excess of births over deaths—of between ten and eleven hundred (1,042) throughout the United Kingdom. In many localities the railway has been carried almost to every man's doorway. England has in fact become the one central point where are accumulating the profits contributed to her boards by ourselves and the rest of mankind, every time we buy a Manchester print, whittle with a Sheffield blade, or borrow on a railway mortgage. She attracts the tributary specie of every nation in whose ports the productions and luxuries of her civilization find a market. The annual profits recorded in the grand ledger of her total trade, have been estimated at two hundred and fifty millions of dollars (Alderman Meehi), and it is scarcely necessary to argue, that such a stream of wealth, whatever its precise amount may be, yearly poured through every channel which her society affords, must reach, and wonderfully affect that class from whom all others derive the staples of their daily food. Of what has thus been done for her agriculture, in connection with the influence of one or two other agencies that could not, even in such a sketch as this, be allowed to pass by unnoticed, we shall hope to present no more than a crude and imperfect picture, the only aim of which can be to suggest and not instruct. And yet at the very outset we might note, in the commanding rank which agriculture holds among other pursuits in England, an incentive, unless I am much mistaken, to a fuller and more

intelligent appreciation by our farmers of the dignity and importance of their calling.

4. Abundant capital and compact population have been much seconded in their influence upon English agriculture by the existence of a decided national proclivity for the country and rural pursuits, pervading every rank and class, — a taste so strongly marked and so effective, that Lavergne, the French author, has not hesitated to pronounce it “the chief cause of her agricultural wealth.” If, in point of fact, the greater unity of purpose and combination of effort which manufacturers and commercial men are every where able to exert, has perhaps given them there, as well as here, a stronger leverage, if I may so call it, upon the legislation of the country, the real power in Great Britain has always resided with the landholders. “We are slow,” writes Alderman Meehi, “to give up our predilection for land as an *honorable qualification*. A man may be a millionaire in mills, machinery, consols or shipping; his mind may be gigantic in learning or science; but, unless wedded to a certain acreage of cold clay or hard gravel, vain must be his aspirations to a legislative seat in St. Stevens.” The “gentry” not only put their country residences after their names in the official publications, instead of their town addresses, as Lavergne remarks, but it is in the country that they are most at home. “Show and splendor,” he continues, “are reserved for the country. Town work pays for the luxury of the country. * * * Just as elsewhere great attention is paid to the handsome parts of large cities, so in England it is the country from which every thing that may offend the eye is removed, that the mind may have only peace and contentment to dwell upon.”

In a more practical point of view, moreover, one hears the tenantry almost uniformly speak well of the liberality of landlords. I think there is no doubt that they have, as a class, stood well up in the cause of improvement, even where involving considerable expense, while there are among them those who have personally set a practical example in it before the whole country. Prince Albert himself is now largely engaged in farming, and it was a source of regret to me in spending a day with one or two members of the Council of the Royal Agricultural Society and some other gentlemen in looking over the three or four farms of which he personally superintends the management at Windsor, that I was in a position to learn so little of the details of the expenditures he was making and the returns obtained — details which would have been interesting, if not practically valuable to the farmers of a republic. He has been a successful breeder, especially of Herefords and Devons, which are kept at two separate establishments, while at a third, called the dairy farm, there are Short Horns, also quite prominent as prize takers, and Alderneys, kept for the richness of their milk. Here the farm buildings, the poultry houses, &c., are built with a wonderful solidity and completeness, the former even lighted with gas. There were new buildings going up at the “Flemish farm,” under the superintendence of Col. Hood, which, in perfection of detail, convenient arrangement and economy, are designed as models. It was the saying in the town

of Windsor that the Prince is a careful manager and a close inspector of the farm accounts; and it will not be inappropriate to quote, in passing, an expression employed at a meeting of one of the most staid and influential societies in the kingdom a year or two ago, on which I chanced to light in looking over the files of an English journal, because it illustrates most forcibly the very point to which I am alluding, and shows how the tiller of the soil has there been rising in his own estimation and in that of others; the speaker having complimented his audience upon the presence of his Royal Highness, by saying that amid other absorbing avocations, Albert had "practically earned, and freshly dignified, a name associated of old with the throne and royalty of England, the name of a British farmer."

5. All this, however, is of value only as it affords evidence that in a country where the influence exerted by rank is such that we can scarcely estimate here its weight with both rich and poor who do not possess it, it is thought to be a just and flattering compliment to connect even the throne itself with the farmer's interests, and because, moreover, it inculcates a more true and solid regard for agriculture than yet obtains with those who aspire to be our leaders, except, indeed, upon the eve of an election in which the farmers' votes are to carry the day. There can be no doubt that efforts in the advancement of agriculture are more highly appreciated in England than anywhere else. It was the voice of England that gave Liebig his early fame. Popular testimonials are an almost every day affair to those who have been effective laborers in the good cause, to such men as Lawes and Mechi, to the conductors of long established agricultural journals, to prominent breeders and farmers. The names of Hope of Fenton-Barns, Hudson of Castle-Acre, and their compeers, are as widely known as belonging to earnest and successful farmers, as those of many a man of political prominence. Jonas Webb, of Babraham, was born in very humble circumstances, unless I was misinformed, but he became first a thorough farmer, and then elevated himself to the South Down championship, and such men as the Duke of Richmond have assisted at his annual dinners. Indeed there are not wanting those ungenerous enough in supplying motives for the actions of their neighbors, to accuse some men of wealth of having taken up agricultural pursuits as a simple, though often exceedingly costly way of acquiring associations, which, in England, money alone cannot buy. Mr. Mechi, for example, the widely advertised vender of razors and razor-strops; Mr. Mechi, the influential alderman, might have gone down to the grave with other dealers in fancy wares and consumers of turtle soup; but Mr. Mechi, the farmer of Tiptree Hall, is invited to Sir Robert Peel's with lords "of high degree," and comes to be looked upon, as he mournfully says himself, in bemoaning, perhaps somewhat ironically, the responsibilities and "miseries" of the position, in the light of a "public improver."

6. The third consideration to which I shall allude has necessitated a practical direction in both the national wealth and the national taste for country life. Those who have heard of the wonderful perfection to which

rural art has been carried at such lordly residences as Chatsworth, where the gardener became the head manager, and subsequently the architect of the Crystal Palace, and was rewarded with knighthood for his efforts; where not only the palace of the Duke, and all the grounds, but the whole adjoining village have been made to accord with the dictates of a moulding and governing taste, compelling both nature and the hand of man to work together in accomplishing every triumph of landscape decoration and garden achievement which the fancy could picture as desirable,—one need not visit estates like this to learn that England possesses a pre-eminence of her own in those ornamental arts which serve to give new beauty to all the graceful and picturesque surroundings of country life. In no other country has the mania for horse racing been so fostered and encouraged, ranking as a legal and sober way of expending one's time and money. The resort, it is true, of many who are merely speculators and gamblers, the races were instituted for the purpose of equestrian improvement, under the pretext of which, Parliament adjourns over for the Derby, and the Queen and Court show themselves as the patrons of the course. Hunting and shooting can scarcely be said to exist elsewhere in any regular, organized and systematic way. Almost every man who can possibly afford it, and some who can't, if rumor be true, will spend his money and risk the integrity of his bones upon a horse or two that can take all the hedges as they come; and the description to me of the scenes that ensue in that season of the year, when the hounds and huntsmen are off, and every villager who can raise a donkey or perhaps a more ambitious nag, follows to see the sport, and the distinctions of class are merged for the while in the delights and excitements of the chase, certainly represented a sight that must be both inspiring and amusing. Citizens hire the privilege of "shooting" over the moors, and fishing in the streams at extravagant rents. Parliament pays the birds as high a compliment as it does the horses, and uniformly adjourns that its members may open the grouse season in Scotland on the 12th day of August, an anniversary like that of commencing the partridge campaign on the 1st of September, and the pheasant shooting on the 1st of October, which is known and yearly thought of by many a longing citizen constantly confined at his trade or in his counting room.

Thus, through these three channels, landscape embellishment, including all horticultural pursuits—racing, and sportsmanship, the rural tastes of English society might have directed all the superabundant wealth and energies at command, but for one great fact: with the increase of wealth and population, agricultural production correspondingly enlarged, becomes a matter of imperative necessity, unless the people are content to seek their food in other marts, paying away for it a constantly increasing proportion of the wages hardly earned in their mechanical toil, without an effort to retain at home the profit it brings them. Up to a period within forty years of the present time, the great effort had been to enlarge the dominion of the plowman and the reaper, by reclaiming, breaking up and enclosing lands previously uncultivated, and either half submerged or lying in barren moors;

a committee of the House of Commons, which sat in 1797, computed the additional area thus rendered productive during the eighteenth century at about 4,000,000 acres, (C. W. Hoskyns, before the Society of Arts, 1856,) and from 1800 to 1820. alone, under the impulse of war-prices, which had carried rents to a point in some cases even higher than they now stand, there are statistics to show that 3,000,000 acres more were conquered from the wilderness and the ocean. Then came a falling off, and a half million of acres, or thereabouts, constituted the whole addition during the succeeding score of years—and before 1840, the limits of the agricultural area of the island had been apparently reached, that is to say, so far as the reclamation of a further surface could be performed at a profit. Additions have undoubtedly been made since and are making now, but their limited extent, and the expense of making them, will probably warrant the remark that England has for sometime passed the point when her productive acreage could be enlarged, and reached that in which the sole resource of her farmers is to increase her acreable production.

7. We shall pass to some of the chief agencies by which this end has been, and is now being advanced from year to year, after devoting a few moments to a notice of those who are personally interested in carrying them on, viz: the landlords, the tenants, and the laborers; for, without a glance at their mutual relations, it would be difficult to apprehend either the means, the encouragement, or the aim of English agriculture, to which I have now successively referred.

Philip Pusey remarks "that the English farmer himself is perhaps the greatest peculiarity of English agriculture," and contrasts the position he occupies, with the extreme subdivision and peasant cultivation under which the lands of France are held, the occupation by the gentry of Germany of their own estates, and the system of share-farming prevalent in southern Europe. So also it differs from the constitution of farming among ourselves in many important respects.

Indeed, the subject of the English agricultural classes, is one on which much may be said. As commerce and manufactures have extended, a resultant effect has been to bring every kind of relation existing between man and man, more and more upon a pecuniary basis; the vassal from the simple debt of allegiance, assistance in the chase, and military service, as he has applied himself more constantly and effectively to the avocations of peace,—and the landlord, as the government has become settled down into that condition of established perplexities, popularly known as the British constitution, and his pursuits and ways of life have met with consequent modifications,—have found new methods of determining their reciprocal dependence upon one another; the relation of property both to its inferior, the occupier, and to its superiors, the crown and the law, with the various obligations involved by inheritance and other connections, has rendered the condition of estates an affair so complicated that, without the *resolution into a pecuniary form* of charges of every kind, which has at length almost uniformly taken place, difficult would it be indeed, to comply with

all the statutes and provisions which there affect the owners and cultivators of the soil. Said Mr. Pusey, "England and Scotland are the only countries with a class of cultivators possessing sufficient capital to stock farms of a good size at their own risk, *paying a yearly sum certain to the proprietor.*" The last stage previous to a money rent was a rent in kind—still nominally the case in some holdings, I believe, but in practice almost uniformly commuted for money.

As might be inferred from the sentence just quoted, the farming capital of the country, other than the ownership of the land, is in the hands of the tenants. I was surprised to learn how generally it is the case that proprietors lease their whole estates, while it is quite unusual for them to retain in their own cultivation an area larger than any one of their tenants might rent, except upon some tracts of a mountainous and far less valuable kind; and, indeed, I met with numerous instances where even the grazing upon the grounds about the mansion was let to other parties, as well as all the tillable land. I suspect, indeed, that English agriculture seldom flourishes by deputy any better than our own, and that "Poor Richard" did not go far into the region of metaphor when he wrote that "He who by the plow would thrive, himself must either hold or drive."

Owing to the superabundant wealth of the nation, and the taste for agricultural pursuits already noticed, together with the difficulty with which transfers of property are effected, there is always an active demand for any that happens to come into the market, and a retired merchant thinks himself fortunate indeed to have the opportunity of getting an estate of any size. Thus the rents paid by the occupants, although they seem to us very high, are in fact but a low interest upon the actual cash equivalent for the value of the property, perhaps two and a half or three, and it may be in here and there an instance, four or five per cent, but I doubt if the average would be above three. Unless the proprietor is an active man, or on the other hand, one to whom pecuniary considerations are of little importance, as I have said, he will very likely prefer to rent all at this rate, rather than run the risk and have the trouble of farming any himself.

8. Turning now to the second class—the tenantry—we find that a farmer, with a certain sum of money at command, will consider it preferable to hire as large a farm as this capital will stock, rather than expend a part of it in buying one of much more limited extent, thus receiving only a landlord's interest on his purchase money, which, if well employed in tenant farming, he will want to make productive of eight or ten per cent. Thus it is only a really very wealthy man who can afford to own land, while numbers of tenant farmers are men of such capital that they could in this country live lives of entire leisure, with the exception of looking after their investments. A gentleman on whom I made a brief call, in quite a retired part of the country, asked me what we considered a man of wealth, and when I told him that away from the cities the possessor of thirty to fifty thousand dollars, and among city people one who has amassed from a hundred thousand to a million is generally looked upon with us as

being "in comfortable circumstances," he answered that within five miles he could point me to three residents on neighboring estates, I think he said, each of whom was considered worth from four and a half to six millions of our money, and to a large number of others, who were only tenants, whose property would more than equal my figures. I only mention this to show how much it takes to be rich in England, and as an additional instance of how property gravitates there toward the country. Mr. Colman mentions a farmer in the Lothians who paid an annual rent of \$35,000, but this must be regarded as a rather extreme case.

The rent paid by a tenant, however, does not cover by any means the expense his crops must pay after they are fairly harvested, before he can put any of the proceeds into his own pocket. There are tithes and poor rates, and taxes of various kinds, differing widely according to circumstances—sometimes very burdensome. If, nevertheless, you express to a farmer the surprise which the aggregate of these amounts at first naturally occasions, and add that you wonder he is willing to be so taxed, he will generally express much satisfaction with the existing state of affairs, alleging that he pays the rent knowing the amount of the additional burden upon the soil, and that if he did not have to pay it in its present form, the landlord's claim would be greater in an equivalent degree,—in other words, that it is the landlord in effect upon whom the taxation actually falls. I observed a similar, although, until explained, an apparently more singular example of the English propensity to be rather delighted than otherwise with taxation, in talking with a member of one of the most eminent brewing firms in the country, who expressed an opinion most decidedly adverse to the removal of the excise upon malt and beer; it is found, he said, to limit competition, and it must thus, like many other imposts on which the British government depends for her revenues, greatly strengthen the operation of that good old English rule,

"the simple plan

"That those should keep who have the power,

"And those should get."—

into a business monopolized by extensive capitalists—"who can," without any particular assistance from anybody else.

To return from this digression, it may be mentioned that the average annual rent of farming lands for the whole island is about \$6 per acre, subject, however, to numerous and wide variations, and apparently regulated in no other way than by the ordinary market law that fixes the price at whatever rate purchasers, or in this case tenants, can be secured. The cheapest lands are the wilds of northern Scotland, generally let, as I was told, in tracts according to the number of sheep they will carry, at so much per head for the sheep. Then we progress to farms in different localities and of different value, from two dollars and a half per acre in the north, Cumberland and Westmoreland, to \$3.75 in some parts of the south, Sussex, Surrey and Hampshire,—\$7.50 in all the central counties, with \$10, or even \$12 and \$15 for the best,—from \$10 to \$20 in the Lothians, and

almost fabulous sums for the rich irrigated meadows near Edinboro', which are bid off annually at auction, mainly to the city milkmen, at from \$100 to \$150, and even still higher rates for each acre.

English farmers generally confine their attention to buying and selling in a great degree, to arranging the management of affairs for the bailiff or overseer, who is immediately charged with carrying them out, and to supervising all that goes on, leaving manual labor for others. I found them expecting, as a general thing, to make the circuit of their holdings once or twice a day, giving directions if necessary, letting the men feel that the master's eye may at any time detect the laggard, and ascertaining whether the condition of the soil or crop is suitable for the particular operations put down for the day's work, in order that any requisite change of programme may be made. In Scotland, the farmers work more themselves, I think; but in England they live independently, not seeking the companionship of gentlemen of leisure, nor affecting their habits, but mindful of their own affairs, attentive to the stranger who is furnished with a proper introduction; and, so far as my observation went, entirely free from those proverbial peculiarities, which, as manifested in many English travelers, have given the whole nation something of that repute with others which should properly belong to a very small class among them, and which may be more nearly characterized by their own word "snobbery," than by any other. The farmers enjoy out-door sports where they can; if the "two ends won't meet" one year, have capital enough to carry them on to the next; love to grumble, just the least bit in the world, about the weather and prospects, like the farmers of *every country but our own*, and, to succeed in the midst of the competition about them, had need be active and wide awake.

Like every general statement, of course, all that I have said is open to exception in some particular instances. For example, I met with one or two who could properly class themselves among the "yeomanry" of England—a word confined to those who farm their own land. The style of living varies, and the style of husbandry. If I speak exclusively of almost all that I saw, the picture would be a very favorable one; but, although I did not wish to examine instances of *bad farming*, having previously had the opportunity at home of studying some of the general features manifested in management of that kind, circumstances placed me in the way of visiting a number of farmers in different counties, who had certainly no claims to be regarded as anything more than fair specimens of the *practical man* in the present condition of English husbandry.

9. I wish that I could proceed with equal gratification to speak of the third class to whom I have referred—the agricultural laborers. Some one has remarked that a line of distinction between the different classes in society is an eminently comfortable and salutary arrangement, if you only happen to stand on the right side of the line; and if, at any time, the thought occurred to me in England, "Would not our farmers be better off and more highly respected if such a division was made, and they were men

of greater capital, and there were others to be the workers," the second reflection has at once arisen, "If our agricultural property was so re-distributed, how comparatively few would be benefited by the change, and how many would be reduced to take the wrong side of the dividing line." The agricultural laborers of England, in fact, constitute a body of which the least intelligent of the emigrants from that country to ours are representatives; for, in pursuing my inquiries as I went along, I was told almost uniformly that it was the best only among them who had the ambition and the means to seek their fortune elsewhere. Consider, then, these men, with their wives and children, often at work in the fields from morning till night; seldom able to read or write; with about as much knowledge, beyond the particular class of duties they perform, as some of our farmers appear to have of the economy and proper application of manures; often huddled together in cottages more indiscriminately than is consistent with the sacredness of family ties, or the simple pleasures of even a poor man's home—and all the poetry and genius with which Robert Burns has pictured the "Cotter's Saturday Night," will only serve to heighten the contrast with what must be the unpleasant reality in too large a majority of cases. Efforts have been making, it is true, to bring about changes for the better, and no doubt improvements are advancing; but to place the diet or the life of most farm assistants in the valley of the Hudson, the Mohawk, or the Connecticut, beside that of a farm laborer there, is like placing the best and most highly paid English workmen of the present day, by the side of the churl who drove to pasture the hogs of Cedric the Saxon.

The laborers often congregate in villages, having to walk one, two, three, four, or even five miles to their work, and it was the remark of one of the most observant and candid farmers I met, as I was driving with him through a village of this kind in Lincolnshire, that such a collection of these people was like a sore on the body politic, and that were it not for the dissenting missions and preachers occasionally going among them, they would really be hardly more than heathen. One sees in truth little to admire in most of the villages, proper, of Great Britain,—for they are so largely composed of that class of buildings which will rent to the workmen for twenty-five cents a week or thereabouts, that, if there is a fine church and parsonage, a stately residence or two, and green lanes winding away between beautiful hedges over some of the pleasantest landscapes the sun ever shines upon, there are also these long rows of miserable tenements, with whose inhabitants it is a source of pride, indeed, if they can bring up a family without being a charge upon the parish. Prince Albert has done something to call attention to this subject; there is an association in Scotland—where it seems to me the tendencies of the people lean to more democratic ways of thinking—to ameliorate the condition of the laborer, and I had there the opportunity of examining, in several instances, improved and comfortable cottages erected for their workmen by humane and large hearted proprietors. The allotment system, or that of allowing a half acre or more of land to

each family, for cultivation and supervision out of work hours, also furnishes alleviation in some respects to the workmen's condition.

I would not, however, make any assertion too sweeping in its character. What a farm laborer once learns to do, he learns to do well; but, as I have somewhere seen it stated, there seems to be a considerably wider distinction between the farmer downward to the workman, than there is upward to the landlord. It is mostly farmers' sons who fill the position of bailiff or steward; they are glad to acquire experience in this way until able to hire and stock a farm for themselves, and indeed, those who hold this position in large establishments, or upon property farmed by the proprietor himself, are rather looked up to than otherwise, by the surrounding farmers. Their sympathies are thus wholly with the farmer, and not with the workman, as if they had raised themselves from this class, and it seems to me there must now be very little opportunity for a child born in it ever to better his condition except by emigration.

10. Reverting now to the remark that the great aim of English agriculture, during the present two score years, has been to enlarge the acreable production of the island, we proceed to inquire how this end has been accomplished.

Among the earlier improvements, the introduction of root crops, and the gradual adoption of better systems of rotation, including the sowing of clovers and grass seeds, and the drainage, in various ways of the water arising from springs or descending from higher levels, were the most prominent. Among the improvements of a later date are to be ranked the increased use of machinery, and better implements; the use of purchased fertilizers and feed; the deeper and more perfect drainage of the land; the improvement in different kinds of domestic animals, and the larger attention given on every farm to feeding them and economizing the manure. These improvements have become so general as to be in the majority now, although there are doubtless a considerable number of those who continue behind their neighbors. There is also a minority still smaller, and of a very different sort—the very “high” farmers—whose operations are bolstered upon unusual capital, and who, while they have undoubtedly done much to advance the cause and awaken discussion, cannot always be safely followed by those in other circumstances. Irrigation on an expensive scale has been mainly practiced by men of this class, so far as I saw it, at least.

11. Mr. Caird has given, in statistical form, the results of his investigations as to the condition of English agriculture in 1851, and compares them at length with the similar investigations carried on by Arthur Young, eighty years before. Taking twenty-six counties, he finds the average rent in 1770, through them all, to have been (at \$5 to the £)... \$3 33 per acre. The same in 1850-51..... 6 70 do
an advance of rent in eighty years of rather more than 100 per cent.

In 1770, the average produce of wheat was 23 bushels per acre.

1850-51,	do	do	26½	do
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Increase.....	3½, or 15 per cent.
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In 1770, the wages of laborers averaged \$1 81 per week.

1850-51, do do 2 39 do

Increase..... \$0 58, or 34 per cent.

In 1770, the price of bread was three cents a pound, of butter 12 cents, and of meat 6½ cents.

In 1850-51, the price of bread was 2½ cents a pound, of butter 24 cents, and of meat 10 cents.

Showing an increase in respect to butter of about 100 per cent, and of meat about 70 per cent, while bread remains about the same. He also shows that wool has appreciated more than one hundred per cent.

After what has been said of the progress of English farming, it may be thought surprising that the average wheat production has been so inconsiderably enlarged; but Mr. Caird explains this by reasoning that eighty years ago, only the best lands were in wheat, while at this time the area on which it is produced has been very greatly enlarged, and the whole of it, bad and good, made to yield 15 per cent more than the selected parts did previously. I suppose that the average of 26½ bushels of wheat per acre, as estimated in 1850, is something like double the average amount that the wheat lands of the United States produce, one year with another.

12. It may be interesting to connect with the foregoing figures some memoranda as to the present condition of agriculture in a single county—that of Norfolk—for much information in regard to which, together with statistics collected by Sir John Walsham within a few years past, I am indebted to C. S. Read, Esq., of Plumstead, near Norwich. It should be borne in mind that Norfolk is by no means entitled to rank as the Garden of England, so far as natural advantages are concerned, however its present appearance and products might apparently justify such an appellation. But a small portion of its surface “can be considered a natural soil for wheat;” and yet we are met by the statistical fact that more than 200,000 acres—more than one-fifth of its total area under tillage—an area “including thin chalks, hungry gravels, and blowing sands,” produces an average crop throughout, of *thirty bushels and one peck per acre* of this grain. Avoiding units and fractions we might lay off the county as follows:

In wheat,	203,000	acres.
In barley, 174,000; oats, 35,000; rye, 6,000,	215,000	do
In turnips, 161,000; mangolds, 16,000; beans and peas, 21,000; vetches, 3,000,	201,000	do
In clover and artificial grasses, 172,000; bare fallow, 10,000; carrots, cabbages, &c., 9,000; potatoes, 2,000,	193,000	do
	<u>812,000</u>	do
Which, with the permanent pasture,	193,000	do
Gives the total area under tillage,	<u>1,005,000</u>	do

The table of live stock maintained in the county, shows one horse to rather less than eighteen acres tillable land; almost one head of cattle to every ten acres; 841,591 sheep to 1,005,135 acres, or not very far short of the ideal of the best English farming, "one sheep per acre," and about as many pigs as there are cattle. It is in thus examining the well attested results of English Agriculture upon large surfaces, that we ascertain really what it can and does accomplish; we are not talking of some "high farmer's" sayings and doings, but we are taking the average of the bad and good over a whole county.*

To reduce the figures exactly to the standard of a one hundred acre farm, in order that our farmers may thus judge upon a more familiar basis as to the allotment of the land and what it produces, we find that the scale of operations in Norfolk, if carried out similarly upon one hundred acres, would give us:

Wheat, av. yield	30 bushels	1 peck per acre	; total	611 bushels,	20.2 acres.
Barley, do	38 do	2 pecks do	664 do	17.3 do	
Oats, do	46 do†	do	184 do	4.1 do	

So much for the grain produced. The proportion of bare fallow would be less than the land which lies waste in one spot and another, on the majority of hundred acre farms with us, being only one acre and a very small fraction. We should then have

In roots, (exclusive of potatoes),	20.1 acres.
In cabbage, potatoes, &c., (including bare fallow as above,).	2.0 do
In clover, lucern and artificial grasses,	17.1 do
In permanent pasture,	19.2 do

Total of the farm, grain land and all,	100.0 do
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And we should be keeping a fraction more than five horses, and nine head of cattle; nine or ten pigs, and between eighty and ninety sheep.

Norfolk presents, indeed, an "expensive style of agriculture," as Mr.

* Since this was written, I have discovered some statistics, very interesting for comparison with the above, in a "General View" of Norfolk Agriculture, "drawn up for the consideration of the Board of Agriculture," in 1796, by Nathaniel Kent.

Mr. Kent estimates the arable land of the county at 729,600 acres, against 812,000 given by Sir John Walsham 60 years later—a gain of 82,400 acres, or about 11 per cent.

He estimates the population at 220,000, but one of his commentators thinks this too low, and calls it 270,000. By the census of 1851, it was 442,714, or an increase of fully 100 per cent on Mr. Kent's figures.

Kent says some parts of the county will produce 48 bushels of wheat per acre and 80 of oats; but in others, the farmer is glad to get 16 of wheat or 24 of barley. He calls the average yield of the county, one year with another, 24 bushels of wheat per acre; but the same commentator above alluded to, considers this far too high, and says that 20 bushels is "rather above, than under the general average." The difference between the average of these estimates, and Sir John Walsham's, shows an increase for the county, in 60 years, of 8 bushels per acre in the production of wheat, or 36 per cent. There are no figures on which we can base a comparison of the number of acres in wheat at the two periods, respectively.

† Neither the soil nor climate of Norfolk suits oats very well, and "the yield is insignificant," says Mr. Read, when compared with the averages of barley and wheat.

Read calls it; for the soil, naturally weak, is of that kind "that if farmed badly, will ruin any man," but so long as such results as these are there accomplished, it cannot but retain its interest for every farmer, however different may be the circumstances in which he is placed.

The story of the improvements wrought out by Mr. Coke, afterwards the Earl of Leicester, has been so often told, that we shall not care to recount it here at length. Finding his tenants throwing up their leases at \$1.25 per acre when he came into the estate, he was able finally to command a rental of \$5 and \$6. It became his object to secure the best of tenants, and through their enlightenment to develop the agricultural resources of his property, because he soon found it to require a degree of personal supervision which no one man could possibly bestow. At the Holkham sheep-shearings, he invited leading practical men to meet his tenants and himself in discussing his measures; it was found an essential pre-requisite that *more stock should be kept*, and to this natural source of increasing fertility was added the application upon the surface of the marl which was found to be underlying it almost everywhere. Then came Art, scattering rape-cake as a fertilizer for the wheat, introducing clover and artificial grasses, and thus enabling the farmer to keep better live stock, while at the same time enlarging his production of the cereals. The Devons and South Downs were accordingly brought into the county, and the four-course or Norfolk system of husbandry was established. The wise and far-sighted views of Mr. Coke not alone effected these immediate changes: but, by the liberality he showed his tenants, and the spirit of improvement he fostered among them, the future as well as the present was embraced within the sphere of his influence; and, although passed away from the scenes of his exertions, his example still survives, and is conducive of further progress not only there, but wherever in other countries the better systems are supplanting the worse.

13. The first farm I visited was located in Hertfordshire, something like twenty miles from London. It had been lately purchased, in rather low condition, by the proprietor. The soil was quite light, and one of Fowler's steam plows was in operation, scarifying a piece of ground on which, I think, turnips were to be planted. The four-course, or Norfolk rotation, was employed, that is, turnips followed by barley, and clover followed by wheat, a course there sometimes so modified as to extend over five years, by keeping the clover crop for two years, grazing it the first, and cutting it for hay the second, or if the land is already rich, by adding a crop of grain, generally oats, in the fifth year. When the landlord drains the farm, it is customary to charge the tenant four or five per cent annually upon the cost of the process, which is usually about \$25 per acre.

The scarifier is a kind of cultivator or grubber, with long, sharp and narrow teeth, used particularly to clean wheat, bean and pea stubbles directly after harvest; to break upland after green crops, or such parts of clover fields as have failed in the plant. The field on which we saw the scarifier at work had been plowed, was then receiving a second stirring, and

would have the clod crusher and roller each carried over it, by way of preparation for a crop of turnips. The previous crop being wheat, and the season of turnip-sowing being so late, in the interim the land had had quite a fallow.

Our drive carried us between some of the first I had seen of England's famous "green hedge rows;" many were grown so high that the narrow lane between them was almost like an avenue. In front of the mansion there was one of those beautiful lawns, so much the envy of our landscape gardeners; the turf, near by, here and there, studded with flower beds, and the whole distance beyond, as far as the eye could reach, converted by a good natural disposition of the trees into a fine example of the graceful park scenery which is considered so essential an ornament to an English country-house of any pretension. While the tree may be out of place in the pasture, so far as the question of economy is concerned, any one who can afford to indulge in a luxury, would find it better, I think, to pay more for a little wood, at least immediately about the home, even if less were paid for the wall-paper within it. For, amid all the varied beauties of nature, I know of none so little worthy of our too common neglect; none presenting a wider diversity in the forms of wayward grace they take; none that are more "their own reward" to him that cares for them, or a more striking example of that wonderful workmanship of nature which they illustrate in so many ways. It is to be wished that something of the English love of having them about our houses, and of the universal continental custom of planting them along our public roads might be transplanted across the Atlantic.

14. In the county of Suffolk, I visited "Butley Abbey," a farm situated fifteen or twenty miles northeast of Ipswich, the county town, and consisting of about 1,000 acres. It is occupied by Thomas Crisp, Esq., who also holds two other farms in the vicinity, of nearly equal extent, or a total of some 3,000 acres. Of the home farm about 230 acres were in wheat, 150 to 180 in turnips, 150 in barley, 150 in "layer" or clovers and grass, together with beans, peas, &c., while of the remainder a part is permanent marsh pasture, and the rest lies in open sheep walks. The latter are generally blowing sands, with not much herbage except the furze, (gorse or whins as it is also called,) which serves probably to lessen or obviate the the action of the wind. The bushes of this furze are eaten off by the the sheep, which nibble away at the outer shoots until those in the centre grow up beyond their reach, perhaps four or five feet high; it is nutritious, and other animals are said also to be fond of it. But the spines of the foliage are sharp, and require bruising before they can be eaten by cattle with any comfort, and the sheep must have become well toughened to them, one would think, to enjoy it. Of these moors the furze is a natural product, but I believe it is sometimes grown for fodder, while machines for bruising it are catalogued by the dealers. During the day the sheep stray about these unenclosed tracts, and with the aid of his dogs the shepherd collects them at evening to be folded. We went out at dusk for a walk

over the farm, and saw a flock coming in, unless my memory is at fault, numbering *sixteen hundred* or thereabouts, and I was told that it is rarely the case in collecting even so many as this, that the dogs and shepherd leave behind a single one.

On Mr. Crisp's farm I saw specimens of the *coprolites* in which the Suffolk crag and some other formations abound,—often so scattered as not to be worth exhuming—now and then occurring, as in the present case, in large masses; they are the fossilized excrements of extinct lizards (*saurians*) and other reptiles, and, as dug, washed and heaped up, no one in passing would suppose the pile to be anything more than ordinary gravel. In use they are either ground or treated with sulphuric acid, as bones are, and contain, according to Way and Gilbert, from fifty-two to fifty-seven per cent of bone earth or phosphate of lime. I understood their intrinsic value to be between \$11 and \$12 per ton, while they sell at different rates according to the state of the market. Between four and five thousand dollars' worth had been taken out and sold from a single acre on this farm.

The sheep of this part of England are prolific mothers, and good milkers, and the females are consequently in demand. Mr. Crisp has a herd of about 2,000 breeding ewes, to which he puts a Leicester or South Down tup. The lambs it is his practice to sell, the autumn after they are one year old, or indeed any time during that season, according to circumstances, and the price received for them varies with age and quality, from \$7.50 all the way up to \$15 per head. The lambs are dropped about March, and when they are ready to wean after harvest, are put out upon the stubbles to eat the "seeds" that were sown in the spring, and at night perhaps folded upon a turnip field as soon as the latter is ready. But Mr. C. keeps a great many sheep out a-boarding, as we might express it; that is, there are many smaller farmers, who do not have the means of keeping a large flock the year round, and who are glad to take in those of their neighbors both upon their stubbles and to eat their turnips. For the lambs thus sent out on stubbles on other farms, about three cents a head per week is paid. The price for turnip land is in the neighborhood of six cents a week for each head, though it varies with the character of the crop, &c.; when it does not exceed this price, Mr. C. considers that there is room for profit to the owner of the sheep. Sometimes he has flocks at a distance of fifty miles or even more, and a great advantage of this method to the small farmer, arises from the fact that while the few sheep he would want to keep might be all winter in eating his turnips off, if he can get five or six hundred on to his fields at once, they are all cleared by Christmas and ready for plowing.

We walked through a field which produced a crop of wheat last year. Mr. C. had also obtained from it what is called a stubble or "stolen crop" of turnips,—seed drilled in rows eighteen inches apart as soon as possible after harvest, and the roots folded off this spring. He calculates the value of such a crop at about \$7.50 per acre; for a fair yield will keep twenty sheep six weeks—an equivalent at the rate paid for turnips elsewhere to

\$7.20, while their manure upon the land is rated as worth about three hundred weight of guano—more, probably, than the cost of sowing and cultivation. The latter consists in the use of Garrett's horse-hoe five or six times, according to the necessity of the case, and in one thinning and hoeing by hand, followed by a forking off of the weeds, costing about fifty cents to the acre. This spring, after the turnips had been fed off, the field was scarified and plowed. Beets were sown about the first of May, after a manuring of from eight to twelve loads of farm yard dung per acre,—the sheep folds having supplied the additional fertilizing material, which, without their intervention, would have been purchased in the shape of artificials.

We have thus seen two crops in the system of rotation, the wheat and beets, with an extra bite of turnips for the sheep intercalated. On land where the last is not taken, the second year's crop would be turnips instead of beets. In either case the roots are folded off along from autumn until spring, or otherwise harvested—the mangolds bearing the frost better, and lasting later in the season than the turnips. In fact the quantity of beets grown in proportion to that of turnips seemed, so far as my observation extended, to be almost universally on the increase in Great Britain.

Sometime in March of the third year, the land is scarified for barley, with additional manure, if the sheep have not already supplied enough. Mr. Crisp drills in six to eight pecks per acre, and sows also twelve to fourteen or sixteen pounds of "small seeds," with rye grass, pretty much in the following proportion :

8 lbs. red clover,	|	2 lbs. white clover,
4 lbs. trefoil,	|	1 to 2 pecks rye grass.

The trefoil, or yellow clover as it is also called, is considered very valuable for sheep. If this "layer crop" is far enough advanced in autumn, it is fed off that season a little ; the next spring, at any rate, it is ready either for grazing, or to come on for hay, yielding of the latter an average of about two tons per acre, thus completing the rotation, as we have before seen it, in the ordinary "four-course shift." In October the land is plowed, or earlier if necessary, having previously received a coating of manure. Wheat is then sown, coming forward as the first crop in the succeeding quadrennial series.

15. In the train, on my way into Lincolnshire, I had some conversation with a farmer to whom I had had a casual introduction, and who favored me with a number of interesting facts in relation to his pursuit, and the general system of the neighborhood. He was farming 850 acres, this year employed about as follows :

170 acres of wheat,	|	30 acres of oats,
150 acres of barley,	|	160 acres of turnips and mangolds,
340 in "seeds," i. e. clover, &c., &c.		

The "shift" or rotation, as would be inferred from this division of the land, is five-course, that is, the land is kept two years in clover, rye-grass, &c.—a crop of mixed "seeds," which is called here by that name exclu-

sively, and in which clover always predominates, if the land is not "clover sick." The wheat is followed by roots, the roots by oats or barley, these grains by the two years' mowing or feeding, and then comes again the wheat. Mr. A feeds a hundred bullocks, and about a thousand sheep; this year he clipped over 1200 fleeces, and seemed a little proud, too, of the fact. Such is the animal machinery by which production must be maintained,—the feeding which supplies the midland cities of Manchester and Leeds with beef and mutton, and enables northern Lincolnshire to send them also quantities of wheat, as well as to furnish Burton-on-Trent with some part of that vast weight of barley she annually malts and brews.

The wool of the Leicester and other similar breeds has been an important item in farm receipts of late. Mr. A. thought his flock had averaged a yield of about eight pounds' weight throughout, and the price obtained had been from twenty to twenty-two pence per pound, say about forty cents.

I think it was with this gentleman that I spoke particularly of the practice which some of us have advocated and others have decried so strongly—that of spreading the manure upon the wheat lands sometime before plowing up the stubble of the clover crop, and permitting it to remain in exposure. There are many in England, at any rate, who constantly practice this way to advantage, and consider that, in no other, can greater benefit be obtained. It helps, in some extent, to bring forward the "seeds," so that when they are ready to plow a few months later, there is a closer and thicker sward to turn over, which will of course yield the greater nourishment it has thus been accumulating, to the coming crop of grain.

16. The land occupied by Mr. TORR, an extensive and successful breeder of Short Horns, from whose herd a number of importations have been made to this country, and on whose farm I spent the next day, varies considerably in character, but is generally rather strong, underlaid by clay or chalk, and capable of yielding quite remarkable crops under good management. The system followed is, generally speaking, the four course shift, although Mr. T. does not bind himself to it, and varies it by occasionally putting some fields in wheat that would naturally come under a barley crop, thus increasing the area covered by the former, without ever taking two white crops in succession.

Upon his land he finds that to manure for the wheat causes frequently too much luxuriance of growth, and he consequently prefers to manure mainly or entirely for the root crop. Not only is the immense bulk of straw which he converts into fertilizing wealth thus employed, but he also spends liberally for oil-cake, guano and superphosphates—buying to a great extent, in lieu of the two latter, a kind of "blood manure," which seems to be now in quite general esteem—and his bill, he told me, for the past year for these materials had been in the neighborhood of \$10,000, (£2,000.)

The wool he clipped last spring, however, would have sufficed to cover no immaterial proportion of this large sum, for he sheared no less than two thousand sheep. The extent of business incurred in the management of such a farm, may also be estimated from the disposition of the land and

the crops it returns. There were about 500 acres in permanent grass, and the other 1600 were divided into wheat 500, barley 250, oats 100, roots 415, and seeds 335. In 1858 the wheat crop was a very good one, and averaged throughout this large surface nearly forty bushels per acre; Mr. T. estimates his average, bad years with good, not far below this figure—perhaps at thirty-six or thirty-eight, while he considers the average of all Lincolnshire as varying from thirty to thirty-two. Two adjoining fields of his best wheat, aggregating sixty-seven acres, averaged, all through, full forty-eight bushels, and of the barley there were twenty-eight acres which produced 183 quarters, that is six and a half (52 bushels) to each.

Mr. T. annually shears about the number of sheep already mentioned; but they did not comprise his whole flock at the time of my visit, as it then included about a thousand breeding ewes, the same number each of yearlings and of lambs, and perhaps a hundred tups. He was to have an annual show and letting in September, and would, probably, reduce his stock before winter to about the usual numbers. Having so much land in permanent grass, he is enabled to graze them through the summer to almost any desired extent. He generally disposes of about 400 fat sheep per year, and the rest of those he breeds are sold, I presume, to other breeders who require them, or some perhaps to other farmers simply for feeding purposes. In the summer he also grazes a few bullocks, but does not feed beasts to any extent in winter, because, generally, his Short Horn herd is large enough to consume, with the sheep, all the hay and straw he has to give them.

The mode of applying the manure to the turnips is, to open a furrow where each row is to grow; in this the "muck" or farm-yard manure is thrown, and upon it, from one and a half to two hundred weight to the acre of guano; after a covering of earth has been turned over this with the plow, the seed is drilled, the machine dropping at the same time with it, from four to eight bushels of ground bones per acre, as the case is thought to require, mixed to a bulk of about twenty-four bushels per acre with sod ashes. These sod ashes or charred earth play a most important part in Lincolnshire agriculture, and appear to be in almost universal use upon the root crop, whatever other applications it may or may not receive. Between fifty and sixty tons of guano were used by Mr. Torr, last year, at a cost of £12 to £14 per ton; and 330 quarters (8 bushels each) of bones, ground, I was given to understand, to what is called the half-inch size, and costing about £1 per quarter.

The cost of labor in the country, generally, is about two shillings sterling per day; the men who care for the horses are taken under a different way from other laborers, and are generally what is called "confined" hands; perhaps they have a cottage furnished, and receive a part of their wages in kind; altogether, at any rate, getting a considerably higher sum than others, partly because their services are necessary, more or less, all seven days in the week, and partly because they occupy a position of more responsibility. One such man is engaged for every four horses; and, if

my memory serves me, there are employed upon the place, forty or fifty horses; it may be rather above the latter figure even.

Mr. T.'s land, with probably the sole exception of the "Riby farm," is situated similarly to, if not actually included in, what is called the "fen district;" a district not requiring here the machinery of wind mills and steam to effect its drainage, as it does on some parts lying lowest and nearest the sea, but much the better for a judicious under ground dressing of pipe tile. Indeed, Mr. Torr looked upon the introduction of *deep* drainage as one of the greatest agricultural improvements the last few years have seen: while in the early times of draining, two feet and a half was considered ample, four feet is now reached wherever circumstances admit; and Mr. T. has, on one of his farms, about three hundred acres, all underlaid at this depth, at a cost of about 1,500 pounds sterling. It is such fen lands, when well drained and properly managed, that will return, in a fair season, the largest wheat crops compatible with standing straw; they may be allowed to get into such condition that the straw will never stand, and, of course, the great end is to hit the medium which runs between too great luxuriance of growth, and too little fertilizing material to admit of the fullest and thickest heads of grain. Two hundred weight of salt per acre may be applied to strengthen the straw, and if thought best, one and a half hundred weight of guano; or, if the land will bear it, two hundred weight of guano, and a proportionably larger amount of salt, either put in at the time of seeding in autumn, or sometimes sown broadcast in the spring.

17. I do not know as I have yet spoken of that feature in English farming which is so universally praised, and which forms such an important item in the cost of production,—I mean the almost entire cleanness of the soil from weeds. I do not refer to it here because I saw in Lincolnshire any cleaner fields than in some other counties. It is this which gives rise to the frequent comparison of the farms of England to the garden cultivation of other countries. To see fifty or a hundred acres in a field of turnips, or twenty or thirty in mangolds, each separate plant, as long as it is young, with as clear a space of well worked soil around it as if there was no other in the field, and when it grows old enough for its leaves to meet those of its neighbors in the rows around, covering over all the land with an unbroken shelter of its own,—this is the perfection of farming, because it accomplishes on a large surface all that could be done on a little plot, and, if not always attained, in fact, is certainly more nearly approached by the English farmer than by any other. He will undertake any labor that may be necessary to rid the field of every vestige of intruders upon its riches, before he sows his seed. Particularly are the roots of the *quack*, that most pestilent and long-lived of evil grasses, carefully raked out and burned. After the young plants appear, the horse-hoe and grubber are freely used. As soon as they reach a more advanced stage, they are "set out" by the hand-hoe, and here again any odd burglar that may have effected an entrance may be at once despatched. This "setting out" con-

sists in one stroke of the hoe-blade, which may be eight inches wide, across the row, leaving a tuft of several plants at every interval, a gang of children generally following to single out all but the strongest one. Much care is taken to single the mangolds completely, but with turnips many go no farther than the first operation, not objecting to allow a number of plants to remain together. The wheat is often horse-hoed either in fall or spring, and frequently, just before earing out, children go through it to pull every stray stalk that don't belong there, and spud out the thistles.

18. Passing over several other Lincolnshire farms I saw, and omitting, for lack of time, the details of an interesting Irish tour, and of several fine farms I visited in the Lothians and Fifeshire, let me give, as briefly as possible, a description of the mode of plowing employed by some of the best Scotch and English farmers, as described to me by Mr. Melvin, an accomplished gentleman and thorough farmer, whom I had the pleasure of meeting at Edinboro', and who is the author of an excellent article on this subject, published in Chambers' Information for the People.

The fields are commonly laid off in lands of eighteen feet in width. The depth of furrow preferred in plowing hay stubble is six inches, and perhaps seven or eight for green crops, with a breadth in the former case of eight or nine, and in the latter of ten inches. A man with a pair of horses will average, in the winter months here, three-quarters of an acre per day.

The most common method of plowing is what is called *casting*. Along a line of poles set up eighteen feet from the side of the field, a furrow is thrown out by the plow, and then a second one made by turning to the left at the headland. Both these furrows are next thrown back with a portion of the firm soil, and then the plowing proceeds round and round until a breadth of thirty-six feet is attained, forming a ridge on each side the poles. The poles which may be just nine feet long for convenience in using them for measurement, are now removed seventy-two feet from the line in which they stood, or fifty-four feet from the last furrow plowed; and here thirty-six feet are gone around in precisely the same way as just described. The unplowed space between these two ridges and the two before laid off, and forming two more, is next plowed—this time the horses always turning to the left instead of to the right, as in the previous instances. By continually proceeding in this manner any extent may be gone over, and the advantage will at once be perceived, of having fields as large as is consistent with the divisions required when the land comes to be grazed by stock, and of having the dividing fences as nearly straight and rectangular as circumstances will possibly admit. In another way of plowing called *gathering*, which was formerly more common, the poles are set up in the middle of the first ridge of eighteen feet, and this is the space gone over, after throwing out the furrows along the poles and returning them as before, although "in practice it is found more correct to leave the outer half of the first ridge unplowed, and to plow the second half of the first ridge and the first of the next. In doing this the plowman is said to wind out the space, which means always turning his horses to the left." The

third mode Mr. Melvin alludes to is *clearing*, or the exact reverse of gathering, the plowman beginning "where he formerly finished," and winding out each ridge by itself.

Mr. M. looks upon a medium length in the mould-board of the implement as preferable, for, the object of plowing being to leave the furrow so that it is well exposed to air and frost, a very short mould-board will break the furrow slice too much, while a very long one will "polish off too smoothly" the exposed surface, instead of leaving it sufficiently rent and torn in the operation of being turned up, to admit of the proper action of the elements upon it. But the feature which requires attention before any other is, that the mould-board should turn a clean furrow; for, if the earth adheres to it in any part, the friction causes loss of power, the furrow is imperfectly turned, weeds are not covered in, and the old surface not turned down.

19. One farm I visited in Fifeshire, embraces five or six hundred acres of land running nearly two miles along the Tay, there a wide and beautiful stream, on the other shore of which is situated the Carse of Gowrie, so noted for its fertility.

Here I found, commonly adopted, a seven year rotation, consisting of 1, wheat; 2, barley—the ground receiving a dressing of farm-yard manure; 3, grass—the seeds having been sown among the barley; 4, oats; 5, potatoes or beans, for which crop manure is again applied; 6, wheat, often manured; and lastly turnips—which, of course, are treated with fertilizers. Some of the heavy lands, which are a stiff clay, have been quite effectually drained, I was told, by digging first a simple ditch, to a depth of eighteen inches; then, with a spade, perhaps two inches wide at its lowest end and not much more at top, a spit is taken out from the bottom of the ditch cleanly and carefully, as this is to form the channel for the water. The original ditch being broader than this channel, shoulders of earth are left on both sides of it, and they receive and support a covering of flat stones, on which—after a layer of straw or similar material to aid in keeping out the wash—the earth is again filled in. Here, as elsewhere in Scotland, the grain is sown more commonly broadcast than is the case in England, and experience has shown, it is stated, that the "benefits of drilling are more marked in poor soils than in rich, on light than heavy land, in dry climates than in moist." Where the surface is less hilly, moreover, machines can, of course, be worked to better advantage.

Both on the Continent and in Great Britain, the women and children do a far larger share of the agricultural work than one is quite prepared to expect, although he may have often heard the fact alluded to. Many operations are performed *by the job*, one man taking it at such a rate of payment, and occupying his own family if he has one, or engaging otherwise a sufficient force of females, or boys and girls, as the case may require, to enable him to complete it most economically. For example, here the reaping is done for twelve shillings sterling per acre (say \$3), paid to the man who binds the sheaves, and who has five women under his superintendence—

the latter doing the cutting with sickles or *hooks*, as they are more generally termed. Ordinary labor costs about twelve shillings a week, and perhaps £18 or £20 per year for hired men, receiving their subsistence wholly or partly.

20. One of the last visits I made, before leaving England, was in quite an opposite direction from that just referred to; a farm in the county of Kent, so noted for its production of hops. The culture of this crop is scarcely of sufficient general interest to warrant my speaking of it here at much length; but the particulars I gathered in regard to the system of general farming there pursued, will, perhaps, be equally interesting with anything already given.

The farm referred to, occupied by Mr. Frederiek Neame, contained about 270 acres, divided nearly as follows:

75 acres in wheat,	23 acres in turnips,
44 in barley,	25 in mangolds,
22 in hops,	24 in clover, and the
32 in beans,	remainder in pasture.

The system of rotation pursued was one of nine years, for example: one, turnips; two, barley or oats; three, wurtzel; four, wheat; five, red-clover; six, wheat; seven, barley or oats; eight, beans or peas: and nine, wheat; thus securing five white crops, three of them wheat, to four green crops. To take this rotation from the beginning, the turnip crop will have been preceded by wheat; after that was harvested, a kind of plow or cultivator called a broad share, is passed over the land, a flat point, eighteen inches wide, being carried about three inches below the surface, not turning over the ground at all, but cutting off the roots and killing the weeds. By this operation, and the subsequent harrowing, the ground is so stirred that the seeds of noxious plants, as well as those self-sown by the last crop, will vegetate. Immediately after the broad share, the harrow is twice used to free the ground from the stubble, which is gathered in rows every fifteen or twenty rods, according to quantity, and if thought worth the labor, or in default of straw enough, this is carried to the yards, to be trodden into manure, otherwise it is burnt. A second plowing takes place, if possible, before the middle of October, say eight inches deep, burying any vegetation that has started, and throwing the soil into furrows as rough as possible, in order that the frost may act upon it; for the rougher and the larger lumps in which it lies, the better will a spontaneous disintegration be effected during the winter. The next process is a plowing, the last of of March or the first of April, after which the land is harrowed twice and rolled. The second spring, plowing is done with the broad share, and after another harrowing and rolling, the manure is carted out and spread, and plowed in six or seven inches deep. Then there is another harrowing and rolling, and the land lies about a fortnight, when, if the weather is dry, the broad share may be once more employed. Swede turnips are sown about the first week in July, and white turnips about the third week, about half and half of each being grown. If mangolds was the crop, the preparation

of the land would be similar, except that one plowing would be omitted, as the seed is sown the second week in May.

The white turnips make good bulbs in six or eight weeks after sowing, and in ten are fit for feeding, being the earliest root on which the sheep are put. The Swedes succeed, and when they are gone, which should not be until late winter or early spring, the mangolds come in season, their great merit being their keeping qualities. I saw through June and July, here and there, the last of the mangold crop of the preceding year not yet entirely exhausted, although they were said to be suffering rather more from decay than usual. The turnip growers in Kent sell, in spring the sheep fatted during the winter upon roots, while the Romney Marsh farmers winter their flocks on the high lands, and take them back again upon the pasturage during a second summer, so that they finally come to market toward the close of the year.

21. The above facts show the labor undergone to *clean and cultivate* thoroughly for a green crop. It will be noticed that the autumn plowing was the deepest, when any raw subsoil that may be brought up is sure to have the benefit of the exposure, and to become well aired and intermingled. The spring succession of plowings, harrowings and rollings, renders the field like a garden. The smooth roller on light land, or a serrated clod-crusher on heavy soils, not only breaks the clods and pulverizes them, but mats together the tufts of couch or twitch, so that the harrows get at them better. Each dressing costs about five dollars, say three dollars for plowing alone, and two dollars for harrowing, &c., and three of these will make an expense of fifteen dollars per acre to start upon. Then the turnips are sown with artificial manure, and the cost of this, together with the farm-dung employed, is about fifty dollars. Add to these two items twenty dollars more to cover rent, taxes, tithes, &c., and then put down the cost of seed, sowing, hoeing out and harvesting, and the total cost shows a considerable surplus over the value of the crop, either for sale or for home feeding, which loss is placed against the great gain of the soil in fertility and tilth. In fact the farmer has not incurred a very great expense beyond that he would have been obliged to undergo, if his land had been a bare fallow, in cleaning and manuring it, while he has his turnip or mangold crop to cover at least a considerable portion of the outlay.

The second crop in the rotation will produce, in seasons at all favorable on this rich loam, fifty-six bushels to the acre of barley, or eighty of oats. If the turnips are so disposed of that the ground is clear of them by Christmas, the barley is put in before that date, and what is sown thus early almost invariably yields the best sample of grain. Living so nearly adjacent to water-communication with London, Mr. Neame often disposes there of his hay and root crops, particularly mangolds, and purchases in return manure from the city stables and other sources, transportation being cheap enough to admit of this being a better policy than the home manufacture of fertilizing material, by the feeding of stock and the purchase of oil cake. But he generally keeps one hundred and fifty sheep to

take care of the turnips, and will, perhaps, feed a dozen bullocks. Beyond four miles from the water, the cartage of manure is found too heavy to make it profitable to buy instead of yarding the necessary dung. The agricultural year begins at Michaelmas, October 11, about which date he would buy in the cattle, and they will be ripe for the butcher in the spring. Soon after harvest the purchases of sheep are made, and they graze upon the grain stubbles in the daytime, and in the night upon the clover fields, from which two crops have previously been cut, until Michaelmas, when they are put upon turnips for the whole twenty-four hours, receiving in addition, in troughs, about equal quantities mixed, of clover and straw, with oil cake. The first cost of the lambs is about an average of eighteen shillings sterling (say \$4.50) per head, and they are sold along after shearing, probably during the month of May, for perhaps fifty-five shillings (\$13 to \$14). Of this about two dollars, as I understood, is received for the wool, which yield an average of six pounds per head, and varies in price from 20 to 36 cents a pound.

As illustrating the difference between English seasons and our own, I may mention that the pea crop is here sown in January or February, while we are most likely to be in the enjoyment of good sleighing. In fact January might almost be termed the only winter month in Great Britain; for the operations of autumn are continued until Christmas, and with February begins the business of another spring. March and April come in to supply what we have very little of, real spring weather of germination and slowly expanding growth, in lieu of that intermixture of summer and winter which this quarter of the year in America appears to the emigrant to resemble. The rye sown for early feeding, is high enough before the middle of April, for the pasturage especially of the ewes and lambs, and by the time our grass at home is just becoming verdant, and while it is too often drowned down by the superabundant moisture, their "layers" and permanent grasses are often covered with a luxuriant and tender herbage, already under the tooth of the flocks and herds.

22. The preceding notes I have given in the form in which they were collected, thinking that if I could succeed in any degree in placing others in my position as a visitor among English farmers, asking questions of them as to all the details of their pursuit, and noting down the answers received, I should accomplish more than could be done in any other way to bring the practical phases of my subject immediately before the mind—for the present contenting myself with facts, without drawing from them any extended deductions or arguments.

There is but one other visit of which I propose to speak thus at length, namely, the day I spent at Burley Hall, near Ottley, Yorkshire, the residence of Thomas Horsfall, Esq., whose contributions and experiments upon the management of dairy cattle and kindred topics, have attracted much attention during the last three or four years.*

Mr. Horsfall has not so extensive an establishment as I had prepared

* They will be found in the Society's Transactions for 1856.

myself to anticipate, but I regarded the time expended there as employed quite as usefully, as any other equal number of hours during my whole absence. The farm includes not quite sixty acres along the bank of a pretty little stream; either the Wharfe itself, or flowing into it, I am not certain which. Forty-three acres, or fully three-fourths of the whole, are in grass. The stock upon the place, at one time and another during the season, had been as follows :

Heifers and bullocks,	21	Two tups and 62 ewes,	64
Milch cows,	20	Lambs,	106

Likewise four pigs, two horses, and a pony.

Making a total of small cattle and large, numbering 218 head—a tolerably heavy stock for sixty acres to carry. The land not in grass was employed as follows :

Wheat, $2\frac{1}{2}$ acres.	Oats, $3\frac{1}{2}$ acres.
Kohl Rabi, one acre.	Mangolds and Swedes, $3\frac{1}{2}$ acres.

Beans, three acres—one acre of winter beans, and two of a long-podded garden variety.

The winter beans, sown in October, were then, Aug. 17, just harvested, and had turned out apparently a good crop. It is one of which Mr. H. is quite fond; it is out of the way sooner than spring beans, so that the ground may be more readily prepared for a succeeding crop of wheat. This is sown without manure, the land being already so rich that it is difficult to give the straw stiffness enough to stand up till harvest. On the wheat field of this year, ($2\frac{1}{2}$ acres,) 15 cwt. of salt were sown in the spring upon those parts where the grain was most liable to lodge; the amount of seed sown upon the whole was only two and a half bushels, and the yield had been two hundred stooks of sheaves—then not thrashed, so that I have no other data for estimating the product obtained. After the wheat a rape crop for spring feeding would be likely to follow, and then oats, perhaps followed by wheat again, and then roots or beans. This would be a rotation of six or seven years, but it is not adhered to with any particular care. Wheat which was to be used for seed, Mr. H. did not house as soon as the rest, in order to allow it to dry and mature more thoroughly.

The particular interest of the place centers more in its live stock and grass fields than in its crops, however, and of these we will begin with the sheep, so as to defer the cattle and dairy matters for our conclusion. Mr. H. generally pays in the vicinity of 45s. sterling, say \$11.25 per head for ewes in October, to the number of sixty or thereabouts. Fifty-nine of the number purchased in the autumn of 1858, had brought him the 106 lambs he had to dispose of in 1859. They come mostly from the north, and are probably a cross of the Cheviot male upon Leicester ewes. He made a bargain with the butcher for his lambs this year in one lot at 24s. (\$6 each) fatted, a few beginning to go off as early as May, when only four to six weeks old, and the purchaser being allowed in the bargain to draw from the number according to his wants—the whole to be taken before the end of July. What were left on hand at the end of June were at that time

weaned. The ewes themselves are fattened, and sold along during August, September and October,—fetching from \$12 to \$12.50 per head; so that the sheep account shows, for not quite a year's keeping of each ewe, (1.) a profit of from 75 cents to \$1.25 in the difference between the price paid for her and the price received, (2.) the fleece sheared from her in the spring, which is quite an item—and (3.) the lambs which she has produced and reared—a return which it requires no argument and little arithmetic to show must be considerably beyond the labor of caring for her, and the cost of what she has eaten.

23. Turning now to the cattle, we find that Mr. Horsfall buys the bullocks he fattens in April or May, grazes them through the summer, finishes them up in the stables, and sells in November; milch kine being found to pay better for winter care. It is the custom, Mr. H. remarked, with the London dairymen to buy in fresh cows as fast as others run dry and are sold, or whenever they need to increase the quantity of milk for sale. It is his system, as I remember what he told me, to keep about twenty cows constantly in milk. He generally buys about the time the first or second calf comes in; but if he finds the right sort of animal, say at three, or still more frequently at four years old, he did not seem so particular as to the season of the year in which she came in his way; milking them for two or three years—the latter period only when the cow's extraordinarily good milking qualities seem to justify it. They go dry from two to three months in the year, and by a little skill in selection, they average about twenty quarts per day when fresh. Mr. H. appeared like some of our best dairy farmers, to prefer a cross breed to a pure; he said that what he always chose when possible, was a kind of cow half Short Horn and half Highland Scots, of which sort, in that part of Yorkshire, there are generally some to be found. As an illustration of the value of such cows as he would select in that part of England, I may mention that the week previously he had purchased three head of these Yorkshire Short Horns, for £45—say \$75 a piece.

These milking cows he keeps constantly in good order, and maintains that much of his success in milk-producing has been due to this fact—that it must indeed be ranked as one "*leading feature of his practice.*" Accordingly, when the cow runs dry in her sixth year, she has been gradually getting fatter and fatter for some time back, and a month's "*finishing*" in the stall is all that is necessary to make her the best of beef. He does not breed any to raise himself, but by this method, some farther particulars of which I am about to give, he accomplishes the double object, as one might almost say, of getting both the milkman's and the stall-feeder's profit out of the same animal.

24. As we go out now to look over the pasture and meadow lands, we shall obtain a little insight into Mr. Horsfall's out-door management, and then an examination of his stables will lead to that part of his in-door operations connected with feeding, while a subsequent glimpse of his dairy

will enlighten us as to the final manipulation of what it is the business of the rest of the establishment to produce.

We saw fourteen acres of meadow, then, which carry about twenty cows and twenty-four sheep, from the time the grass is well up until the middle of October, with very little assistance from other sources. Another lot of twenty acres, every yard and foot of which is such that the cattle are fond of it, has usually supported, Mr. Horsfall told me, a bullock and one and a half head of sheep with their lambs, to each acre. To these pastures the cattle and sheep are generally admitted about May 16th, previous to that time grazing upon the hay or meadow land, and thus allowing the pastures to have a good start,—the best possible security, Mr. H. thinks, against injury by subsequent drouth. The meadow is thus eaten close early in the season, but by the end of June will cut two and a half tons of hay per acre, and generally yields, also, a second crop and an after math. From this twelve acres of meadow I saw a fine stack, and I have not before referred, I think, to that peculiarity of English farming which every traveler notices at once—the stacking up of the grain and grass, so that these beautifully constructed and beautifully thatched evidences of plenty and skill, form a most prominent feature about every farmstead—a stack cut this season from the field referred to, measuring thirty-three feet in length, twenty in breadth, and fourteen in height, and supposed to contain at least thirty tons. Mr. H. estimated the weight of ordinary hay at sixteen stone (14 lbs. each, I suppose) per cubic yard, or 224 lbs.; but his early cut hay he said, was exceedingly compact in the stack, so closely packed indeed that he had repeatedly found it by actual trial to weigh 28 stone per cubic yard, or 392 lbs. This is remarkably heavy. He finds great advantage, he thinks, in early cutting, never letting the grass get into full flower.

The best pasture is a deep alluvial loam, but the meadow, which is irrigated, is naturally a thin soil and a strong clay. The irrigation comes from a little brook into which the sewage of the village of Burley flows, and is simply performed by being admitted at the highest point, a gentle knoll, whence furrows having a very gradual descent carry it over the whole, the water when turned on trickling out from these channels through the grass. It is allowed to run through the winter until March, when, as I have already mentioned, the meadow is grazed until May, and then another irrigation ensues to give a start to the hay-crop, and after mowing a third flowing takes place.

I stated the number of animals kept per acre on the pastures, with the qualification of "some little assistance from other sources." This assistance only consists I think in a little cooked food for the milch cows, and in the fact that when the pasturage begins to be less hearty, say at just about the time of my visit in the middle of August, they are stabled at night, and receive a little grass in the stall. This grass is often obtained from the same pasture with a scythe, for, at intervals where the droppings of the animals have laid, the herbage will not have been eaten off, and a man can

soon cut enough of the rank growth thus produced to serve for the housed stock, and if not wanted for the cattle, it is cut just the same and given to the horses. In this way not only the whole growth of the field is completely economized, but the grass itself is kept in better growing order, as well as in better appearance. In hot weather Mr. H. is in the habit of stabling his animals in the day and letting them out at night. All the grass land is also subject to farther manurings, of which we shall speak in connection with the stables and their management.

Of the grasses Mr. Horsfall likes best the *poas* and the *festucas*, the former genus comprising a number of varieties among which what is there called meadow grass (*poa pratensis*) is perhaps the best known, and the latter class or *fescues* being generally regarded, I think, as peculiarly suitable for low lying grounds. For under grasses, as he called them, and clovers, he don't care so much. His lands are all drained, the lines of pipe-tile running eight yards apart, and from three to four feet deep, the latter depth being found preferable, and having been employed in the drains most recently put down.

25. Mr. Horsfall's simplest feeding stable was an inexpensive building, of which I had the curiosity to take the exact measurement, as he seemed to like the plan on which it was put up quite as well as any other, and as its cheapness, moreover, is such as to put it within the means of any American farmer. The inside length was forty-two feet four inches—outside width fourteen feet ten and a half inches. The back wall was of brick, seven feet three inches high, the end walls also of brick with doors. The front of the building, toward which the roof sloped, was probably about six feet high; it was composed of six pairs of doors, so that this whole side could be thrown open if necessary. The roof was of slate and *thatched underneath*—a very simple and not uncommon English method, worthy of adoption here, of maintaining a more even temperature by keeping out extremes of heat and cold,—the spaces between the roof timbers being filled in with straw, held in place by light strips nailed across, or in some other similarly cheap and easy way. In speaking of slate roofs, I think it is Mr. Mechi who recommends whitewashing them; because, as he states, the rains of summer will not carry it off, and the sun's heat is then reflected, while the snow and frosts of winter will at once remove it, and then what heat the sun gives will be absorbed.

A wing attached to this building contains feed and a well sheltered apartment for roots; while the water from the roof is collected in a tank, from which a tap may be added to carry it by one turn of a spiggot into each stall. I have forgotten whether the last arrangement was already in operation, or whether it was spoken of as an improvement to be made. One improvement was suggested as worthy of attention in erecting such a stable, viz: The provision of slides in the doors for better ventilation, or what was thought perhaps preferable, the hanging of the doors in two parts, so that either top or bottom alone might be opened or shut at pleasure.

Coming now to the interior arrangement, we find that a little greater

width would allow an alley-way for feeding—which runs along the back wall, and toward which the heads of the animals stand—a little wider and more “handy”—its width now being only about thirty inches. The building accommodated eleven or twelve stalls—their width being three feet six inches to three feet nine inches. The manger bottom is only two or three inches above the level of the floor. Its inside width at bottom is fourteen inches; the inside board is nine inches wide, sloping outwards, and the back of the manger one foot eleven inches high, also with a slight slope, so that its inside width at top is fifteen and a half inches. In front of the stall a timber runs three feet eight inches high from the manger bottom—say four feet two inches outside height from the ground. This would leave an aperture of about twenty inches from the back of the manger to this piece of scantling—eight inches of which is filled by a board hung upon hinges to the latter, so that when feed is put in from the alley way it opens back for its admission, while the cattle cannot push it outwards so as to put their heads through.

The stall partitions are about five feet wide from the extreme front; the cattle are fastened by a chain about the neck, attached to a ring sliding up and down upon a stanchion about a foot back from the manger in the side of the stall. The floor of the stall is worthy of particular description. A piece of cocoa nut matting three feet square occupies the upper end, having straw under it, and securely fastened down. Back of this there are grates opening into a tank beneath, not quite three feet deep, two feet eight inches wide, running the whole length of the stable. The grates are of the same width as the tank, each one three feet three inches long, fitting neatly together, and with the rest of the floor, and capable of removal one by one for any temporary purpose. The frame is made of three by three inch timber, with slats four inches wide and one and a half inches thick, and two and a half-inch spaces between the slats. The distance from the manger to the outer edge of these grates is seven feet eight inches.

Of the underground tank there are six extensions, answering as outlets, one at the end of the building, and the other five along the side, the outlets enabling a man to work at any part of the tank in removing the manure more conveniently than could otherwise be done, and to some extent entirely upon the outside,—a cart backed up to where he is at work and no doors being open to chill the animals. There is a pump to take as much of the liquid as can thus be drawn off. No bedding beyond the mat is used for the cattle. The more solid parts of the manure are taken away in carts, and sometimes mixed, especially if they are not to be immediately applied, with the scrapings from the adjacent public road or the cleanings of the ditches. But it is to the application of this substance to his grass lands, almost without stint, that Mr. H. owes their unflagging, or rather, I may truly say, their constantly increasing productiveness. A dozen good loads spread upon an acre just before a gentle shower, will be washed into the ground like a healing ointment, there being no straw or other coarse material in the way. The time for manuring the meadows is as soon

after the mowing, as the weather suits; for the pastures, during the winter. The liquid manure is often mixed with the rest for application in this mode; it is also pumped into barrels and put over the pastures in spots where the cattle don't appear to like the grass so well, or where it is coarse and wiry, or on spots a little bare; and three or four doses of this kind in winter or spring, are said to bring on the herbage wonderfully, and indeed seem to change its nature at once. If there is an extra supply of the liquid manure, it may be carried to the source from which the water used for irrigation is distributed, and poured in there to render it still more fruitful of good as it is diffused over the field through the diverging channels already described. In what I have just said about the tank, I omitted to mention that it contains a partition having interstices between the boards just so as to let the liquid part through into a little compartment with which the pump connects, and retain the more solid mass behind. Mr. Horsfall estimates the annual production of manure from cattle, if it is well preserved, as worth at least £5 per head.

Dr. Voelcker had then just published in the Royal Ag. Society's Journal an Essay on Liquid Manure, which, as I subsequently read it after visiting the Cirencester school, appeared to me eminently practical, sound in its general reasoning, and cautious in its conclusions. But Mr. Horsfall thought it calculated to impede rather than increase the use of Liquid Manure, because Dr. V. classes "soils containing a fair proportion of clay, especially stiff clay soils," among those not benefitted by its application, thus running exactly in the teeth of the long continued and successful practice at Burley Hall. Dr. V. also advocates the dilution of liquids, a thing that Mr. Horsfall never does,—drawing his argument too exclusively as the latter thought, from the Flemish farmers on the sandy soils of Belgium. It is undoubtedly true that to use liquid manure to advantage upon stiff and retentive ground, the land must be well drained and in good order; and, of course with these pre-requisites, Mr. H. considered its application more effective there, than anywhere else. He would not apply it in very hot weather, of course; preferring a murky if not absolutely a rainy day, and thought that any previous dilution would then be attended with evil instead of good results. It seems quite possible, however, that upon drier and lighter soils, or in a climate less moist, the reverse should be the case, as Dr. Voelcker argues.

26. For steaming the food the cattle get, Mr. Horsfall employs cans made of block tin holding three bushels each, which last in use about two years, and are portable and easily handled. His apparatus accommodates three such cans, which are filled three times a day for the twenty milch cows he keeps in winter,—the mixture steamed being composed at the time of my visit in the following proportions, the quantity mentioned being that prepared for each cow's daily subsistence:

Rape cake.....	5 lbs.	Malt combs.....	3½ lbs.
Bran	1½ lbs.	Indian meal	1 lb.
Straw cut to half-inch length,.....10 to 12 lbs.			

This mixture is just dampened—the degree of moisture it contains being

a very important matter, and one which experience must determine—the food having a greater or less laxative effect, according as the water in it is increased or diminished. Cotton cake Mr. Horsfall has also employed to good advantage, and Indian meal he considers the most fattening food he can get, if it is properly mixed with other substances—indeed the composition of the feed given in winter, unless I am mistaken, would vary from the above by the substitution in it of three or four pounds of Indian corn instead of one. The steam is admitted to this mass for about an hour, and there is really something quite attractive in the odor it exhales—an effect which must be increased in a cold day by its warmth. Mr. Horsfall modifies his feeding materials of course with changes of price at different times. He has in past years used a great deal of bean meal to good advantage, but at present it is too dear for the purpose, and wheat bran and other substitutes are cheaper, as will be perceived from the fact that while wheat has heretofore averaged 56 shillings, and beans 34 shillings per quarter—that is wheat at \$1.75, and beans at \$1.06 per bushel, the former was selling this year at \$1.25 per bushel, and the latter at \$1.56. The cooking of the feed he estimate to cost for fuel only two pence (four cents) per cow per week, while with but little additional assistance in preparing the food and in milking, one man has the entire charge of the twenty cows. The advantage of feeding straw, in Mr. Horsfall's view, consists in the fact that you thus utilize as fattening agents those elements in it, which would escape by fermentation, if it were converted into an ordinary dung heap, while the very ones which alone render it of service as a fertilizer, are those of which the animal economy can make no use, and which are therefore thrown off by it, and collected in his tanks for the same destination they would otherwise have taken, but performing a double office when they reach it.

27. The price at which the milk is sold from this establishment is four cents a quart; but there not being sufficient demand to consume it all in this way, what is unsold is made into butter, perhaps to the amount of fifty pounds per week. There is an old well at the very door of the dairy room, employed for the sole purpose, as there are waterworks which supply all that is used, of cooling the cream in hot weather, before churning—a can containing it being let down twenty-six feet the night beforehand, where the temperature stands at about 46 degrees. The dairy room is purposely a small one, as the temperature there can thus be much more easily regulated; and upon maintaining it properly, much of his success in butter making is believed to depend. There are several tiers of shelving around the room, hollow, several inches deep, and lined with sheet lead. A current of water, cold in summer and hot in winter, is kept in constant circulation from one to another, and Mr. H. finds that he can thus keep the thermometers that hang at one or two different points in the apartment, at from fifty-two degrees to fifty-six degrees with great equability. The upper shelf about the room was covered with an inch or two deep of charcoal, which had been found to operate most successfully in the preservation of an atmosphere constantly sweet and pure, without such an admission of the

exterior air for purposes of ventilation as would be necessary without this precaution. Unless I have forgotten, however, the sides of the room near the top were also provided with one or two outlets for the escape of any foul air that may rise from below.

I was particularly interested in what I saw and learned at Mr. Horsfall's, because it showed so plainly the practical nature of all the experiments he has undertaken, and because the numerous details with which it furnished me, became of double value in connection with his writings, which have already had a wide circulation in this country. I may allude very briefly to one point in them to which Mr. H. particularly called my attention. In calculating the value for feeding purposes of various articles of food (Royal Ag. Society's Journal, vol. 18, p. 170), the percentage they contain of starch, sugar, &c., was reduced to fat by taking "the proportion as 90 of starch, sugar, &c., to 50 of fat." Mr. Lawes, from experiments which I think he has subsequently made, is led to the conclusion that five to two is a more correct proportion than that of 90 to 50, which I believe Mr. Horsfall thinks probably more correct, and explains by supposing that some oxygen combines in the process of digestion with the carbon of the food to form carbonic acid gas, and is thrown off and lost. This does not affect the ultimate results of Mr. Horsfall's investigations, but he thought it worthy of being placed on record with them.

28. In giving the foregoing transcript from my notes of farm visits in Great Britain, I have taken several farms almost at random from among a number at which I had the good fortune to spend a longer or shorter time. But I selected the visit at Mr. Horsfall's, particularly, because his investigations and experiments have before been published by the Society; the account above given, although long, might have been still somewhat fuller, but for the risk of overrunning my limits and venturing too far upon the forbearance of the reader. I have altogether omitted any account of Mr. Mechi's transactions, for the reason that so much is now in print in relation to them; and while I may here acknowledge the gratification and instruction derived from a day spent at Tiptree Hall, I should also express my conviction, notwithstanding the opposition its proprietor has often met, and the occasional extravagancies into which he may have been led, both in his expenditures and his expectations,—that, by arousing the public mind and "agitating" the cause of better farming, he has really done much for the good of English agriculture.

29. I can scarcely consider it within my province to speak at much length of the Domestic Animals of Great Britain—a subject which would involve the full consideration of the different breeds, and the principles which guide the best breeders of them. But there are some points of view in which it must be regarded, however briefly, for it forms perhaps the grandest feature in the present agricultural development of the British Islands.

It is nothing novel to remark that probably in no other country of equal

extent does there exist such variety in its breeds of domestic animals as in Great Britain. To begin with cattle, from the dwarfed inhabitant of the Shetland islands, and the hardly larger breed that thrives, like the goat, on the Kerry hills, to the races of Scotland, of Hereford, of Devonshire, and then of the channel islands, we pass in review characteristics nearly as various as those which generally distinguish the breeds of the most widely separated regions. Beginning at the north, the shaggy West Highlanders or Kyloes, as they exist at present, "with short, muscular limbs," chest deep and wide, straight back, well arched ribs, thick, but mellow hide, long upward curving horns, "bold, erect carriage," produce choice beef under a rough exterior, and will ultimately fatten where some other breeds might scarcely live, although requiring a period correspondingly longer in arriving at perfection. Then we come to the Galloways, black instead of tawny in color like the West Highlanders, and entirely without horns—otherwise not dissimilar to them, and claiming at present the earlier maturity and greater symmetry which result from the greater care and better feed of which they have been the recipients of late years. Thirdly are the Aberdeens and Angus cattle, showing a step in farther advancement toward what is regarded as the highest type in the beef producing races, *the most meat in the best shape in the least time*. The Galloways occupy rather more than an intermediate position between the first and third of these breeds, for they so closely resemble their relatives in Aberdeenshire, that there are those who claim an identity between them, except so far as the latter have been for several generations in better keeping, and have, as I have heard it intimated, not impossibly a bar sinister in their pedigree, derived from a slight touch of the Short Horn.

In speaking of "the most meat in the best shape in the least time," as the highest type of excellence in cattle bred for the butcher, it should not be forgotten that when we compare one breed with another, we are comparing what each might accomplish if all were put on equal trial *under those conditions most favorable to development*. We must not overlook, therefore, that such conditions are by no means universally within either the farmer's reach or inclination. Consequently, although some one breed, according to such a comparison as that referred to, may possess a marked pre-eminence, it cannot be universally superior to all the rest, and I think I shall be justified in defining the "best breed," either of cattle, or of any other race of animals whose services or flesh are useful to us, as that which attains the greatest excellence compatible with the position it is to occupy and the treatment it is to receive. Consequently it is seldom proper to use the words *better* and *best* of one breed or another, unless the proviso is understood that differences of climate and pasturage, and careful or careless treatment, are for the moment ignored. The stony hills of our eastern states would scarcely be likely to unite precisely with the richest pastures of Ohio and Kentucky in the definition of the "best breed of cattle" in actual practice; even if, in theory, coinciding exactly with them in the desire to

produce the heaviest flesh upon each carcass most compactly and most quickly.

It would perhaps be unnecessary to call attention so particularly to this point, if it were not one upon which considerable misapprehension actually exists. A farmer sees some particular breed highly spoken of, tries it and is disappointed simply because the requisite conditions for the display of its good qualities are not present. Upon no subject indeed is greater discrimination essential. And when a farmer, who has heard much of "improved animals" and "fancy prices," meets with ill success, he is at once ready to conclude that the whole thing is one of those "humbugs" in which "book farmers" delight to indulge. Take the Short Horns, standing as they do in the front rank of the English breeds: unrivalled in aptitude of accumulating and maturing their flesh at an early age, they have gained almost universal recognition as "the best," at least where the best facilities can be given them; but, just as a money-making citizen, whose word is law on 'Change, might be in a very miserable plight if left to shift for himself in the midst of a wilderness, even with all his gold about him, so it is quite possible that an animal accustomed to the highest nursing of "high farming," would be sorely at a loss how to render its good qualities advantageous, if allowed to combat unsheltered with the storms of an American winter, to graze under a scorching sun upon a well cured bit of side-hill pasture, or compelled to make up for the dryness of its fodder in the wetness of those miry pools which—mingled with snow and ice in their proper season—constitute the variety of scenery found too often in the American farm-yard.

The object with which I have written is not to intimate that the Short Horn is delicate and tender, but if possible to draw a lesson in passing, as to the folly of neglecting due attention to our domestic animals, and expecting them in turn to thrive, unless they be of a kind long hardened to exposure and starvation. As popular as the breed in question is every day becoming with us, I have no hesitation in saying that it is not the one for the majority of the farmers of the country until they learn to appreciate and treat it better, and that as this lesson is from year to year more commonly inculcated and regarded, just so rapidly we may naturalize among ourselves a kind of cattle that shall justly rank with the "best" either at home or abroad.

30. Returning to some notice of the other chief English breeds, we find that the "Long Horns," at one time the near rivals of the "Durhams" of our day, have lost their importance almost entirely—having been supplanted even when they were brought to their highest perfection by their more successful competitors. In Herefordshire we come upon a race that might perhaps have fared better in the friendly conflict, if circumstances had at any time combined to bring it into similarly extensive notice, and led to so general efforts in its improvement. Possessing as it does such merits that many of its friends claim for it equality with or even superiority to the Short Horn, it has, notwithstanding, seldom acquired a permanent footing out of its native district, and even there has had a sharp rub with its more

fortunate opponent. The examples of the breed which I saw in the English show yards, and at Lord Hatherton's estate in Staffordshire, were such as to excite some surprise that a greater share of the public regard has not been retained by it, and it struck me that we have never yet learned to do the Herefords justice in this country. Another breed which has been of great service to us, and which I mention after the others, not because it is less important, is that of Devonshire; a breed, of which as compared with the Short Horn, it may be safely predicated that each possesses advantages of its own, without equalling in all respects the other.

In Kent there is a kind of cattle not very different from the Devon, but I should call it larger boned and less symmetrical; in Suffolk, a race of hornless or polled cattle, which come more properly among the dairy breeds, under which designation the Ayrshires and Alderneys are also classed. The Ayrshires have received more attention, undoubtedly, than any other breed, as far as quantity of milk given is concerned; while with the Alderneys the point of superiority is in its richness of quality.

31. After this very brief glance at what are the most prominent breeds of English cattle, both at home and abroad, let us pursue, for a moment, the question of the farmer's policy in relation to them. I quote a writer in Morton's Cyclopaedia:

"Let us suppose," he says, "that instead of resorting to markets for our supply of grazing cattle, we have resolved upon rearing them at home. Our first efforts must be bestowed in obtaining a suitable breeding stock, as upon the skill with which this is done our success will largely depend."

The selection, it will be borne in mind, is to be made not with regard to maintaining the purity of any particular breed, but for the simple and sole purpose of procuring for ourselves the most serviceable grazing beast—

"to obtain animals which will yield the largest return in the shortest time from a given amount of food. Our chief attention must be given to the selection of the bull, as our whole experience has gone to prove that in cattle breeding the qualities of the progeny are most influenced by the male parent. The more therefore that the properties sought after are concentrated in the bull, the more confidently may we calculate upon finding them reproduced in his offspring, and upon obtaining a lot of calves of uniform quality. By concentrated qualities in the bull, we refer not so much to the degree in which they are developed in the individual, as to their being hereditary in the family from which he is descended; and here it is that *pedigree* becomes of importance—of actual money's worth—to the mere bullock breeder; for where he is so fortunate as to secure a bull from a herd in which excellence has long been hereditary, he may calculate with certainty on a large measure of the same excellence being communicated to the progeny; whereas if he trusts to his eye only, it is quite possible that he may get hold of an animal which owes its personal excellence to but one good descent, and whose progeny will in all likelihood, betray the inferiority of his remoter parentage. * * *

In selecting our herd of cows we must look for vigorous constitution and large frame; that mellow hide and full eye which indicate aptitude to fatten, and in particular, for large milkers—such as, on generous fare, will yield milk enough to nurse three calves apiece, * * * which of course implies that we must purchase at least two for each cow that we mean to keep, and that pains must be taken to get them of good quality. A ready way of doing this is to allow the free use of the bull kept on the farm, to the cottagers employed on it, or living in the neighborhood. If the bull is of the right sort, a very excellent and uniform lot of calves can be obtained in this way, notwithstanding the very motley and inferior class of cows usually kept by such persons."

The conclusion of this extract brings us to another most important lesson for our farmers, viz: that the true secret for the improvement of their

stock is by the use of an improved male. Whether it is designed to breed cattle for the butcher or for the dairy, all the experience of farmers and dairy-men appears to show, here as well as in Great Britain, that it is not good policy to begin with keeping none but the high priced animals of some one distinct breed, unless the business of raising breeding animals is to be made the sole and controlling object—a business in which it need scarcely be added that great capital, tact and energy are now requisite to obtain a degree of excellence such as to ensure success. The farmer seldom has these to spare beyond the constant drafts upon them of his daily pursuit. His true course, therefore, is to select with good judgment the females which nearest meet his wants, and never to admit to his herd a parent of the other sex, which will not be certain to stamp his offspring with his own merits. Comparatively a short period in this way may be made to work a wonderful change. Suppose that any farmer at the beginning of his career decides upon this as the end to be unflinchingly kept in view, and then examine the stock upon his farm after an interval of ten years; and, unless the whole career of those men who have brought the domestic animals of Great Britain to their present position is entirely at fault, they will even then most surely bear witness to a great and unmistakeable progress for the better. It need only be suggested, that whether the bull obtained be Devon or Short Horn or Hereford, he should be of direct and unquestioned descent, and that a line of action once marked out should not be forsaken unless for very good reasons. Associated resources will procure the best of blood where individual means are not sufficient, and clubs for stock improvement should be far more universally organized.

32. By the "best of blood" I do not necessarily imply that which commands in all cases the highest price—an important distinction, and one that leads me to the second point of view from which I wish to speak—that of the breeder himself. In discouraging the farmer from attempting too much at once, we do not do it to the detriment, but on the contrary to the manifest advancement of the breeder's own interests. Says the writer I have just quoted, after insisting upon the necessity of well concentrated qualities in the bull, as to the possession of which his pedigree furnishes testimony so convincing and so important: "In cattle-breeding the well established principle of division of labor should have full scope, that is to say, the generality of farmers should confine their attention to the production of beef, [or of cattle for the dairy, as the case may be,] and leave the breeding of bulls to the select few, who may possess the skill, capital and leisure so necessary for the successful prosecution of this difficult and precarious department of the business. We insist the more on this point," he urgently adds, "since the neglect of it has more than anything else hindered the improvement of cattle in this country"—a statement which if true of England, should possess ten times greater weight with us, whose capital and leisure are so much less than theirs, and where neither our climate, nor the buildings nor condition of ninety-nine out of every hundred of our

farms, will offer facilities for careful breeding at all comparable with those possessed by the majority of English farmers.

There should, therefore, be a sufficient demand among our farmers for well bred bulls, to encourage good breeders of them in every State. To those who breed for the sake of really advancing the position of any particular breed, of accomplishing more than others have ever accomplished before—the choice of this or that descent in a particular animal, or the possession by it in a marked degree of some particular quality which they wish to attain more perfectly, will render it worth to them almost any sum that can be named, in comparison with a failure of attaining the object in view. But no farmer need be told that such prices as the breeder will cheerfully and judiciously pay, would just as certainly end in disappointment and ruin to him, as though he were to wrap his money in a napkin, like the man in the Scripture, and put it in the ground to grow. Every breeder must select the best for his own herd, to perpetuate its good qualities in both sexes, and for the surplus he should be willing to receive, and the farmer to pay, a reasonable price.

In concluding what constitutes a reasonable price, the breeder will, of course, regard the cost at which he has produced what he wishes to sell; not only the first cost of its parents, but also the risks to which he is constantly put, and the expenses, necessarily heavy, of caring for parent and offspring in a way to develop both most certainly and securely. The farmer, on the other hand, or the club of farmers who are to become purchasers, will inquire as to the length of time the bull will be serviceable, and the extent and probable value of his services for every calf he sires. If this inquiry properly conducted does not prove that his offspring will bring enough more in money to have really returned the price paid for him within a reasonable period, we can only come to the conclusion that some sad error was committed either as to the selection or the price. It is dollars and cents by which the scale is everywhere turned in the end.

33. Let us look for further illustration of the subject to the sheep,—of which the same great principles which govern the breeding of the ox, hold good, and that in still greater degree if possible in Great Britain, because in English husbandry I really do not know but the sheep is the more prominent animal of the two. It is the custom, as many are already aware, for prominent breeders not to sell the rams they rear, but to *let the services* of a large portion of them from year to year—a practice also prevailing with bulls to some extent, but not upon so large a scale. Those whose names are not so widely known, will simply invite all in the neighborhood who are interested in sheep, to visit the farm on some particular day, and conclude their arrangements by private bargain; sending circulars perhaps over the country, according to the number they have to offer, and the repute in which their flocks happen to stand. Those who are well established, and who are certain of a good attendance, have a similar anniversary, when they put up the services of each animal by auction. Jonas Webb's South Down letting, which I attended last July, will form a good

example of this kind, and a more particular reference to it will give us a phase of English farming which we have not yet seen.

The rams, of which about a hundred and thirty were then on exhibition at Mr. Webb's, had each a number affixed on either slope of his broad back, and were ranged along for the admiration and scrutiny of the curious customer. Lists were posted up in sight, giving the age, and amount of the last clip of each, together with that important item, the price at which his services were offered to the Agricultural public. An attendant told me that Mr. Webb had about fifteen hundred breeding ewes, and a thousand lambs, and as there are among them five distinct tribes, he never has to go beyond his own resources to secure a change of blood. The ram lambs, within a fortnight after they see the light, are examined, in order to select about two hundred of the best of them, to be retained as breeders. Mr. Webb will not sell a ewe in England, but disposes of some to foreign countries, and will not retain in his flock any that do not shear their seven pounds of wool as yearlings. The majority of the fleeces are said to be a pound heavier than this, and among the heaviest carcasses that have gone to the butcher, some have reached fifty pounds per quarter.

Of the rams which have been most noted, there was one now five years old, for the use of which during three successive years, 410 guineas in all have been paid, or an average of about \$700 a year—a pretty good revenue to get out of any single animal other than a race horse. But there is another which Mr. W. kept for his own use for two years—in order to do so, refusing a thousand dollar offer for its annual services. And 360 guineas were even offered by one person for a year's use of three rams—an offer that was not accepted—and in 1856, at the time of the great Paris Exhibition, the Emperor presented Mr. Webb with a testimonial of plate, thus not only expressing his approbation of the sheep, as he has often done by purchase and hire, but also in witness to the eminent achievements of their breeder.

The three points most sought by Mr. Webb, have been, I believe, weight, early maturity, and hardiness of constitution, combined of course with symmetry and due regard to the production of wool. He has met with most flattering success, and although, of late years, other flocks have arisen, perhaps equally as worthy of public confidence, he still retains in a great measure, the pre-eminence acquired by his early example of improvement. We saw, after the letting was over, a field of three hundred ewes, which, for general excellence and some instances of rare merit, were considered most remarkable.

About two o'clock, the previous part of the day having been occupied in examining the merits of a hospitable lunch within doors, and of the sheep themselves without, the audience gathered around the auction ring, and were requested to call any desired number, the caller of the sheep of course expressing thereby his wish to become its hirer at the price stated in Mr. Webb's offer on the list mentioned above. Several numbers were at once given, and No. 12, the first asked for, a four year old ram, put up at 50

guineas, elicited some lively bidding, and went off at 70. For the next there was no competition, and he brought the price at which he was rated, 35 guineas. It illustrates, indeed, a rare exercise of good judgment, not only upon one's own basis of determining the merits of his stock, but also of the wants and opinions of everybody else, to enable a breeder to fix a price varying as widely as from \$25 to \$275, upon each individual animal out of one or two hundred, and, what is more, to vary the prices with the respective values of all, so nearly in accordance with the views of his customers, as Mr. Webb is constantly in the habit of doing.

There had been a hundred and seventy-five rams in course of preparation for the letting, but the actual number offered was 124, the odd fifty having been already let or otherwise disposed of before the arrival of the public day. This list of 124 included one five year old, eight four year olds, twenty-five of three years, forty-two of two years, and the remaining forty-eight yearlings. Their average yield of wool per head at the last clip was 7 lbs. 14½ oz. for the yearlings; 8 lbs. 6½ oz. for the two year olds, and 8 lbs. 9 oz. for all the older ones. The bidding went on until fifty-four of the number put up had found hirers, when there were no further calls, and the remainder would serve to supply the private demand through the season.

The 54 rams rented were put up at an aggregate sum of 1,154 guineas; they realized a total of 1,312, which is an average per head of £25 9s. 10d.—about \$127. There were about two hundred visitors, among them a gentleman from New South Wales, Australia, who had been buying no less than seven Short Horn bulls, a heifer, and several sheep; and when, in due season, judgment was granted for a stay of proceedings, the usual degree of generous alacrity was manifested in complying with our host's kind invitation to dinner—a genuine English ceremony, with bountiful provision for guests, and subsequent toasts and speech making, of which we scarcely know anything at all in this country.

The lettings of Mr. Sanday, the foremost breeder of Leicester sheep, have brought higher prices per head than those recently obtained by Mr. Webb for his South Downs. The principles on which they are conducted are so similar, however, that no farther particulars will be necessary. The point which I mainly sought to impress upon the mind, was the English machinery connecting breeder and farmer, the enterprise of the latter availing itself of the skill of the former, and both indebted in a sum, of which no estimate can be justly formed, to men like Bakewell and his associates, who early set an example of what we may almost term the *scientific* improvement of breeds,—an example which has been so effectively followed in cattle, sheep and swine, and, to some extent undoubtedly in horses also, that Continental and Australian farmers, not less than our own, have paid to England, as the head-quarters of good breeding, prices unparalleled I suppose, so far as records go, in any previous age of the world's agriculture.

34. The estimates of live stock in Great Britain now show (Lecture by Robert Bond, Dec. 7, 1859, before Halesworth Farmers' Club,) that also

supports for *her whole area*, the enormous number of one sheep to every two and one-half acres, and one head of cattle to every nine and one-fourth. In the State of New York, according to the census of 1855, there was one sheep to every eight and eight-tenths acres (nearly), and one head of cattle to every thirteen and one-half acres (not quite), that is, less considerably than one-third the sheep in proportion to acreage, and but little more than two-thirds as many cattle.* The average weight of the English sheep and cattle as compared with our own is enough greater to increase the disproportion still farther. Cattle were exhibited at the Smithfield Club show this winter, weighing upwards of 1400 pounds at less than three years old, and sheep of twenty months, weighing from 140 to 170 pounds each. In the examples of English farming of which I have already given some details, one can but remark the number of animals fed upon every farm. The English farmer's first object, writes Lavergne, is to keep a great many sheep, for his observation has taught him that it is of all animals "the easiest to feed, the one which derives the greatest benefit from the food which it consumes, and at the same time gives the most active and rich manure for fertilizing the land."

Now it seems to me as the first and most prominent result of my observations in Great Britain, that in the *increased growth of meat* we must take our first step toward an increased production of grain. "No cattle, no dung; no dung, no corn," is the proverbial form into which English agriculture has condensed this lesson. Mr. Spooner, the English writer upon cattle, states that within thirty years the amount of stock kept upon arable farms has there been doubled, and he ventures to prophecy, that it will be doubled again within less than thirty years more. What is the consequence, as I found it stated wherever I visited a farmer, large or small, from the time I began in Hertfordshire until I embarked for home in the Mersey? Uniformly that the more straw was converted into manure this year, the more there would be to undergo the process the next; in other words, that whether money be apparently made or not in the operation, without it no money could be made out of anything else. The "high farmers" feed such quantities of oil-cake that they often expect to lose upon every bullock they send to market, but they look farther for remuneration; when the product of this feeding is carried over the ground, and the seed is sown, and the harvest gathered in, then they expect reimbursement for the manure they have made and applied at a cost so great.

I do not by any means doubt that these measures may be carried to an extreme, but still less do I doubt the propriety of urging more attention to their domestic animals as manure-makers upon American farmers everywhere. If their farming, instead of that across the ocean, had been taken for my subject, I might point to some examples in our own State which most triumphantly illustrate the argument, and from my own observation, I know that these examples are actually effecting improvement in

* This proportion of cattle, it may be remarked, is a better one (if the figures are trustworthy) than I was prepared to anticipate.

gradually widening circles. What has been termed the problem of a self-sustaining agriculture for our country, is destined to be solved, I am convinced, only as we learn to pile, broad and high in every field, some testimony to the fact that we endeavor to return, as far as we are able, the bounty of Nature, by carrying back to the source of all she gives us to keep bright and warm the fires of animal life, those substances from which, without entirely consuming them, it has renewed its vigor. She has long been a faithful handmaiden to our farmers under a heavier burden than she well could bear; in another sense beside that of illustration merely, let us supply at least the straw, if we are hereafter to exact from her the full tale of brick. Let me repeat the pithy adage I have quoted; would that its simple and homely language might ring in every farmer's ears, "no cattle, no dung; no dung, no corn."

35. By no means, however, do we find a universal panacea in these eight words alone. English agriculture has a second lesson, namely, that without *good drainage*, which is to the land almost what the circulation of the blood is to the animal, dung and labor, both medicine and food, are in a great measure thrown away. She has a third, which is that it is the farmer's business to grow grain and not weeds. She has a fourth, namely, that it is sometimes politic to go beyond the resources of the farm for the purchase of manures. And a fifth and last (so far as we are concerned at present), which consists in paying greater heed to the lessons of Science as well as of Practice, in order that the two, hand-in-hand, may unite in educating, experimenting and explaining, where either alone could only blindly speculate or blindly delve.

In other words, I apprehend that the characteristics of English agriculture, which should be most thoroughly sifted and studied with us, are, first and chiefly, the home production and use of more manure by the agency of the animals fed upon the farm, to which we have already referred; secondly, the proper drainage of the soil; thirdly, more attention to thorough tillage, and complete cleanness from intruding weeds; fourthly, the employment, when justified by circumstances, of artificial manures and feeding materials—under these last mentioned two divisions, including those crops which are grown either expressly for their improving effect upon the land, or for the use of animals whose manure in this sense may almost rank with purchased fertilizers; and, finally, more earnest and better organized effort in obtaining well conducted experiments, in carrying on scientific investigations, and in deciding the difficult question, as to how and in what the education of our farmers' sons may be advanced. It will be at once seen that, in the elucidation of these points, years might be profitably spent and volumes written. Our only attempt can be to sketch the merest outline, scarcely allowing ourselves the briefest reference to the effects there produced by these agencies,—to which I referred, at beginning, as co-operating together to enable the English farmer to turn every circumstance of his position to the best account; and which, properly and discriminatingly

viewed, might be made, I believe, of invaluable assistance to our farmers in accomplishing the same end.

36. As all that I could say—so briefly—either of the philosophy or practice of draining, would not add anything, unless corroboratively, to the excellent treatises that have been written upon it by Thomas, French, and other authors, let me occupy a single paragraph with the illustration of this and its cognate subject, irrigation, afforded by my visit at Teddesley—the admirably managed estate of Lord Hatherton, in Staffordshire,—prefacing it with the remark that thorough drainage is considered in Great Britain of such importance that Mr. Torr, of Lincolnshire, the farmer of over 2,000 acres, some of whose operations I have described, expressed to me the unhesitating opinion, that *the mere deepening of drains* to three or four feet, recently inculcated and largely pursued, instead of two or three, as before generally in vogue, was the most important of all the late improvements effected in English agriculture.

It is one of the most important subjects of consideration in farming to attain two or more ends if possible by the same means. The land at Teddesley fortunately lies in such a way that the water obtained for the drainage of upwards of five hundred acres of land—a part of it an elevated swamp, almost—can be used both as a source of power, and subsequently for the irrigation of about 115 acres of grass. Its quality proved it to be well suited for the latter purpose. Collected in a reservoir from the lines of tile, of which the mains were laid at a depth of three feet, generally, but sometimes much deeper where the substratum on which they rested rendered it necessary—a constant flow is afforded all the year round; a covered channel carries it about half a mile to the farm buildings, where an excavation was made thirty-five feet deep in solid rock, in order to get sufficient head, and an outlet tunnelled for five hundred yards through the same solid material into the irrigated valley below. This, of course, rendered the operation a very expensive one, but it allowed the use of an overshot wheel of thirty-eight feet diameter, estimated at twelve-horse power, which does all the thrashing, grinding, &c., of the establishment. From an account published soon after the completion of these improvements, Mr. Colman copies the statement that the total cost of underdraining 467 acres, of arranging for the mill, and of the irrigation of eighty-nine acres, was between thirteen and fourteen thousand dollars, but the annual rental of the estate was thereby increased over \$5,000, so that the handsome interest of thirty-seven per cent was the clear result of the outlay.

From Mr. Bright, the judicious manager of the farm, to whom I was provided with a note of introduction by the kindness of Mr. Caird, I learned that there were this year about 112 acres in wheat, 120 in barley, 60 to 70 of oats, 50 of mangolds, 60 of Swedes, 20 of beans, and 10 of potatoes; the whole extent under his control, being, I think, some 1,700 acres, including, however, in this area, the park and pleasure grounds, which are beautifully arranged and carefully attended to. The stock kept was,

August 1st, 1,500 sheep, 78 swine, 26 horses for work, and eight others, and 179 head of cattle, mostly Herefords, including at the time of my visit, one or two in preparation for the Smithfield fat cattle show at Christmas.

Returning from what is at present a digression, let me remind the reader of the acts of Parliament, making loans for drainage purposes. Now there are also several incorporated companies which, in a somewhat similar way, place drainage within the means of land owners who desire to procure the capital requisite for the purpose. These companies also advertise to undertake "irrigation, enclosing, wood grubbing, road making and farm buildings," as well as drainage, by either carrying on the process themselves or loaning money for the purpose, the outlay returnable by way of rent charge for a period of years to suit the borrower.

37. Under the head of thorough tillage, which forms the third item for consideration, the implements in use upon English farms claim, in passing, our more particular notice. To begin with the steam plow: there are many efforts now going on to introduce and perfect it there, and the exhibition of the two which are at present most successful, attracted crowds at several of the agricultural shows I attended the past season. In both of these the idea has been abandoned of constructing an engine that is locomotive in principle—a form in which too great a proportion of the power is consumed upon the draft of the machine, leaving comparatively but very little for that of the plows, and beside compressing too much the soil which it traverses with a weight necessarily so great. In Fowler's steam plow, the engine is constructed with a windlass drawing a wire rope backwards and forwards, like an endless chain, upon a fixed pulley at the other side of the field, attached to what is called the anchor, both the engine and anchor drawing themselves along the headlands by a simple contrivance, as fast as the ground between them is plowed. To avoid the necessity of turning the plow around at each end of its furrow, it is provided with two sets of shares facing in opposite directions, with their beams fastened together, so that when one set of shares is in the ground, the other sticks up at an angle of about 45 degrees in the air. The course of the plow is regulated by a plowman, having a seat on it for the purpose. Four shares work at once, or three on lands too heavy for a larger number. Besides the engineer and plowman, there must be a man to attend to the anchor, and two boys to keep the chain out of the plow's way, moving it along in the middle of the field as the work proceeds. This steam plow has taken the Royal Agricultural Society's twenty-five hundred dollar prize (1858), the Highland Society's thousand dollar prize (1857), and several smaller ones. Its cost is £650, or about \$3,250.

The Smith machine has never received many prizes, but seemed to be rather the favorite of the two, with many practical men, notwithstanding. The manufacturers say that about forty sets of this machinery are now at work, thirty of which were purchased by tenant farmers. Mr. Bright expressed himself highly pleased with one he was using at Teddesley, and told me that he should consider it well worth buying if he were only the

tenant of a 300 acre farm. Mr. Smith does not use the plow—not, so far as I know, because his machinery could not be made to draw one, but because he thinks his “cultivator” preferable. It is intended to accomplish with teeth, what the plow does with the share, except so far as *reversing the soil* is concerned, stirring it thoroughly and leaving the stubble in condition to be raked off or otherwise collected and removed. Unless I am mistaken, any portable engine that can be taken into the field will answer the purpose; the windlass being a separate and by no means complicated affair, consisting of two rollers, one unwinding the wire rope as the other winds it up. The rope extends around the field, having pulleys attached at the corners, and wooden rollers here and there for it to run on. The cultivator is attached at one corner of the field, where the operation begins; one roller on the windlass, in winding up the chain set free from the other roller, draws the cultivator along the side until it reaches the end of the furrow, when it is swung around, still remaining attached as before; the *other roller* of the windlass then begins to wind up by a very simple change of gearing, and so the implement is drawn across the field and back again, until the whole is completed. The price, exclusive of an engine, was about \$1,000, adapted for use with one of eight horse power.

38. The attention now given in England to improved implements, may be inferred from the fact that the catalogue of this department of the Royal Society's last show formed no less than 450 pages, comprising 4,700 or more in number, contributed by 235 exhibitors. Of drills, there were 53 exhibitors, taking the lead in number, so far as this is an index of comparative importance; 43 each of plows and steam engines, and 13 of sub-soil plows and pulverizers; 39 of thrashing machines; 30 of horse hoes; 36 each of harrows and straw or chaff cutters; 22 of clod crushers, and the same number of cultivators or scarifiers; 30 of farm gates and posts; 24 of horse-rakes; 17 of mowing machines; 11 of reapers, and so on. The leading prize was that of \$250 for the most successful application of steam power to the cultivation of the soil, which must be added to the catalogue already given of Mr. Fowler's honors.

As to the prices of implements, they are generally, I think, higher than might be expected. Plows, for instance, cost, according to the Ransomes' catalogue, from \$19.50 for those having one wheel in front, to nearly \$22 for those with two wheels, and I do not see a two-horse swing-plow, that is one without any wheel, put down lower than \$18. One variety for four horses costs \$34, and there is a small pony plow with wooden beam marked as low as \$7.50. Harrows are put down at \$20 or \$25; cultivators and scarifiers from \$30 to \$135; horse-rakes as high as \$42.50; thrashing machines, for use with a seven-horse power for from \$500 at the lowest, to \$650 for all the improvements.

In referring quite briefly to one or two implements that may convey a lesson in connection with this subject of the thorough tillage of the land, let me say that I found the cereal crops put in very generally with the drill in England, not so frequently, however, in Scotland. Morton's Cyclo-

pedia, to which I turned to find if possible an explanation of this fact, refers it to the greater scarcity of labor in the latter country. The practice of cultivating to eradicate the weeds after the grain is up, I found usual in several cases, and in many more gangs of weeders were habitually sent through the field to pull out all the worst, such as docks and thistles, at some convenient time before the grain is in ear—perhaps most often as early in the season as April. The general distance between the drills is seven or eight inches. I gained the impression that the mode of putting in the seed with the gang plow after broadcast sowing, was quite general, instead of drilling, in some localities—but producing a similar effect.

There is one machine which I must also recommend to the greater attention among my countrymen, which, indeed, I doubt not, it is destined by degrees to receive—I mean the steam engine, as a coadjutor wherever the farm operations are of much extent. It is found of use in so many ways, not only by its power, but in the employment of its waste heat for cooking purposes, that we can only ascribe its less frequent use among us where labor is so high, to the division of the land into smaller farms. Horse powers, too, made as they are with us, accomplish very much. But we only need to perfect—what now may perhaps seem too chimerical a project for sober consideration—some system by which the portable engine that thrashes grain and cuts chaff, and saws wood and cooks feed at the farmstead, can go out into the field, and from its position on the headland, draw the plow, the drill or the reaper, to render it an absolutely indispensable adjunct wherever the hills are not too steep and the soil too stony for machine cultivation. This combination of out-door and in-door work appears to me by no means an impossible thing—but our inventors of steam plows, I fear, have none of them yet gone to work in the right way to bring it very speedily about.

39. To conclude, I may quote the remark of Mr. Morton in a recent paper, (read Dec. 9, 1859, before the Society of Arts,) as showing the present position of English farming in this respect. He remarks that Agriculture, which was once wholly the work of men's hands, and which has there long since given up the tillage of the soil, and the carriage of the manure, and the sowing of the seed, and three-fourths of the hoeing of the crops to be accomplished by the horse—has lately given up the thrashing of the grain, and the cutting of its straw, to be effected by steam power—and is now rapidly abandoning also the work of reaping to the former, and of cultivation to the latter.

Nevertheless the human labor required has not diminished; machinery in agriculture, as in manufactures, has only turned it into different channels. As agriculture, he continues, becomes more and more “the work of intelligence and skill as well as power—those parts of its processes, where intelligence and skill are wanted, are becoming a larger portion. Cultivation is more perfectly performed, and over a greater extent of land—the crops cultivated require more labor and are more productive—the stock consuming them is proportionally larger and needs proportional attendance.

Probably each acre cultivated in 1759 employed more manual labor in its cultivation than each acre cultivated now; but how many more acres are there under cultivation now than then? Each bushel of wheat grown half a century ago involved so much more labor, that 8s., say \$2, was the lowest price at which it could be grown with profit; but how many more bushels per acre does land upon an average yield at present? Each pound of beef and mutton cost more in wages thirty-three years ago than now; but we have a double and triple store of food for stock; we have two crops of fattened sheep where formerly we had one, and each supplies a double quantity of meat."

Mr. Morton also introduces some very interesting statistics that are entirely new, I think, at least in the form in which he puts them. Twenty-one millions of people are occupying in that island (England and Scotland) a grand farm of nineteen millions of arable acres, and probably nearly as much more of grass land; 950,000 men, 120,000 women, 300,000 lads, and 70,000 girls are employed as laborers upon this farm, or, averaging them according to the wages they receive, probably equal to an aggregate of 1,150,000 men, or one to every 17 acres of arable land and perhaps 17 acres more of pasture. Of the 1,500,000 horses fed and used upon this immense farm, probably 800,000 are employed strictly in farm labor; while 10,000 horses are yearly added in steam power to the effective forces of English agriculture. Moreover, returns collected from the leading manufacturers of steam engines, show that they have supplied within ten years past upwards of 40,000 horse-power, as a tireless and cheaper substitute where human muscles were growing weary and even animal labor becoming too expensive.

40. In what I have said as to the use of Farm Yard Manure, I considered it perfectly safe to recommend its manufacture without limit or qualification. In coming to speak very briefly of Artificial Manures, I do so with the conviction that our best policy here, if we employ them at all, is only to do so at first upon a small scale, so that a careful trial may be made of the value of any particular one that it is proposed to buy, before risking a large sum, even upon the strongest recommendation of manufacturers and salesmen themselves.

In Great Britain, however, it is the rule and not the exception to expend something for purchased manures. Mr. Torr, for example, as I have stated already, upon 2,000 acres of land, spent about \$10,000 annually for superphosphates, guano and oil cake. Turnips are almost uniformly put in, so far as my observation went, with something of the kind, and I frequently had the opportunity of noticing the result as shown by the difference in different parts of the same row, where for some reason or other the drill had here and there failed to let down the fertilizer with the seed. The farmer is protected there better than here against imposture in the value of what he buys, for he has learnt to insist that most manufactured manures, especially if they have not the guaranty of a manufacturer unquestionably both an honest man and a capable chemist—shall be sold only

upon the condition that analysis, if called for, shall prove them to be what they are represented.

Says Dr. Voelcker, a most accomplished authority upon the question in hand, "It is quite an erroneous view to think that an artificial manure should answer the same purposes for which common farm-yard manure is usually applied. Farm-yard manure is a perfect and universal manure, and, if you have plenty of it, it would be foolish buying artificial manures." He then proceeds to say that where the loss entailed by feeding animals or other considerations renders farm-yard manure itself too costly, or where a judicious selection of artificial manure will make that of the farm-yard go farther than it otherwise could—in such cases, purchased fertilizers become a convenient and profitable auxiliary. He classes all substances containing nitrogen as the special manures for the cereals and grass crops—of which guano is the most prominent example. Phosphate of lime, in the right form, is extremely useful for root crops. But, he afterwards adds, "those who think that good crops can be secured by merely using guano, or superphosphate, or nitrate of soda, or any other artificial manure, without adopting other means, will find themselves grievously disappointed." The proper use of them, in his opinion, requires almost a special training and education, as well as superior intelligence. But in any event they cannot be made the sole dependence for success in improved farming, and will prove a broken reed in the hand of him who introduces no other improvements into his practice, expecting to accomplish everything with them alone.

41. Prominent among the agents of progress in English agriculture, must be regarded the Agricultural Societies, at their head standing the Royal Society of England. It was a part of my allotted programme to say a few words in relation to their exhibitions the past year; but I should first remark that it is not through their exhibitions alone that they are effective of so much good. Not only does the Journal of the Royal Agricultural Society form the repository of many most valuable researches, including surveys of the different counties, and experiments both in practice and science, but the papers and lectures frequently elicited by many of the provincial bodies, by the Society of Arts at London, the Highland and Agricultural Society of Scotland, &c., are most valuable contributions to the cause of advancement.

The show of the Royal Agricultural Society was most striking to me in three respects. The first was the extraordinary turn-out of implements, to which I have already alluded. It was not only extraordinary on account of the number of exhibitors, but for the large show made by all the more prominent firms. Manufacturers go to great expense to bring full collections, and expect to do a good stroke of business by it, the largest houses, I was told, sometimes taking orders for four or five thousand pounds' worth of machinery during the days of exhibition. A member of one of these firms mentioned to me in conversation, that the expenses and outlay con-

nected with the exhibition he made this year, would actually amount to not far short of a thousand pounds.

As to the animals, the average of merit throughout might perhaps have excelled at this show, that at any exhibition ever held in the United States, but I am not prepared to say that some of the exhibitions both east and west would have suffered in the comparison, in particular classes. No one could fail to be struck, however, with the attention that all had received, especially as regards feeding up for the exhibition. Implements and animals constitute the entire show, as no premiums are offered for fruits, flowers, domestic manufactures, &c., as with us; and, considering the much greater accessibility of Warwick, situated almost centrally as it is between the four ports of Liverpool, Hull, London and Bristol, to the farmers and breeders of a kingdom so compact in its agricultural improvements, I should have really been surprised that there was not a larger turn-out in the stock yard, had I not learned two reasons that operate very much to reduce the numbers that are shown; exhibitors are much more fastidious than with us, as to the merits of what they contribute in the first place—occasionally appearing to consider it something to boast of simply that this or that animal “was shown at the Warwick meeting,” even if it received no prize whatever; and, in the second, because many who know their animals are meritorious enough to win an honorable rank, do not care to prepare them for competition by high feeding, at considerable expense, and some risk to their future and perhaps an entire forfeit of their present usefulness. I fancy, too, that they are wide awake enough to find out when possible, what prominent breeders are preparing to compete, and in which classes there is likely to be the least or greatest chance—a kind of calculation that cannot add to the extent, however it may affect the degree of merit possessed by an agricultural show.

The character of the attendance was particularly worthy of remark—including, as it did, not only many gentlemen and some ladies of aristocratic rank, but also large numbers of those who showed their appreciation of the object by the price they were willing to pay; for Tuesday, when the implement yard was alone open, nearly two thousand paid half a crown each, that is about sixty-three cents for admission; and not until Wednesday, P. M., and then at an *additional charge* of a dollar and a quarter, were the animal classes visible to any one but the judges. This made the price of single admission to the whole, nearly two dollars on that day; I do not know how many paid this sum, but, judging from the appearance of the stock yard, the number was by no means as small as one might have anticipated, and the papers stated that nearly nine thousand were admitted to see the implement part. Thursday, when it is my impression the charge for the whole was half a crown, there were about 20,000 admissions. I do not know the results of Friday. These facts seem worthy of so particular mention, because they illustrate the spirit with which English farmers unite in the support of what they know to deserve encouragement; for I fancy that the object of placing additional means of usefulness in the

hands of the society, was quite as prominent in the minds of many who were there, as merely the purpose of gratifying their own curiosity or of acquiring what additional information they could at the exhibition. So far from seeing any thing "aristocratic," as some of our people say, in these arrangements, it seemed an eminently excellent provision that those who would willingly pay more for a view unimpeded by an urgent crowd, should have the opportunity of thus conferring at the same time a benefit upon the Society; the difficulty in introducing similar regulations here would arise, I fear, not so much from the principle of the thing, as from the lack of so large a class able and willing to act upon it.

In the arrangement of grounds and buildings, I am so egotistical as to doubt if we have any thing to learn from our transatlantic brethren, and indeed I don't know but some of us could give them a serviceable hint or two. But the greater general interest taken in their shows, enables the foreign societies to be more exacting with exhibitors and others, sure of public support in enforcing the regulations they make. For example, all entries are obliged to be submitted a certain time in advance, thus affording an interval for the preparation of a complete catalogue, which is one point of convenience and value in which our exhibitions are sadly lacking. The public, moreover, are rigidly excluded until the labors of the judges are over, that the officials may be neither tampered with nor incommoded in performing their duties. No exhibitor in any department, at present, will act as judge—even in a department entirely disconnected with that in which he has a personal interest, in order that he may thus publicly avoid the most remote appearance of evil. The catalogues are sold at stands all over the grounds, and are thus an additional item of expense to visitors, although they would be cheap enough in reality at double the price asked for them, particularly to an entire stranger. The stewards of the respective departments attach premium labels to the prize animals or articles as soon as they have authorized reports on which to act; a list of awards is at once printed as rapidly as possible, and is generally in time for sale upon the grounds during the last two days of the show or even more.

42. In connection with the Agricultural shows I may allude to the subject of *Market days*, which has of late been attracting some attention among ourselves. Without time to go into detail, let me merely remark that in bringing the farmers of a county, or even of a less extensive district, together, once a month, for the transaction of business, they put within their reach some means of improvement otherwise far less accessible. An example of the kind was first brought to my attention in Scotland, by the "United East Lothian Agricultural Society," as it is called, a body answering exactly to a county Agricultural Society among ourselves. Mr. Hope, of Fenton Barns, one of its directors, to whom I am much indebted for information and many polite attentions, placed in my hands a copy of the Report of the Society for the previous year, from which I learn that it is their custom to take advantage of these periodical gatherings for the purpose of holding several shows in the course of the season, which must

contribute most effectively to the usefulness of such an association, but which of themselves would hardly be likely to attract attendance from a distance, or where coming entailed any expense, without the additional attraction of market-day business. For instance, the 5th of March, a meeting was held at which prizes of \$10 each were offered respectively for seed grains, as follows: spring wheat, the Chevalier barley, any other approved variety of barley—the potato, late Angus, Hopetown, and any other improved variety of oats—best beans, and lastly, for the best assortment of grass seeds, comprising eight bushels each of “red and white clover, annual, perennial, and Italian rye grass.” The quantity of seed grains required for competition is ten quarters or eighty bushels. A second show was held the 12th of March, when prizes were offered for fat and breeding stock, including bulls (Short Horns,) stallions and swine—a prize of no less than £50 (\$250) being offered for the best draught stallion, with the condition, undoubtedly, that he should remain for service in the county. By varying such prizes as this as occasion may demand, from year to year, it will be easily understood how a Society may become the engine of accomplishing great good. The exhibition was held at Salton, away from the market town, July 6th, and there prizes were offered for brood mares for draught and for the road, for entire colts, geldings and fillies, for cows and heifers (Short Horn) and several classes of Leicester and South Down sheep. Two more exhibitions conclude the list—one October 1, when five prizes were offered for seed winter wheats; and the fifth and last, December 17th, when a dozen prizes were offered upon roots and root crops, including eight for best sample twelve roots of different sorts, and the other four for best five-acre crops. Here we have a programme affording due encouragement for improved seeds, as well as improved stock, excellently calculated, as it seems to me, to serve as a model for adaptation by our county societies, either in addition to their present autumn exhibitions, or in some cases as a substitute for them—serving, as I think it must, to keep the interests of the society constantly in the minds of the farming community, as well as to promote mutual intercourse and a friendly rivalry. Haddington, or East Lothian, it may be well to add, is a county of 36,000 population, and less than 180,000 acres area of cultivated ground; its society numbers not quite 200 members, the lowest membership fee being half a guinea, or \$2.50, while the larger farmers all pay twice this sum, and the proprietors, according to their generosity,—several putting down their names for \$50 (10 guineas), and one, the Marquis of Tweeddale, for \$75. From the treasurer’s report I learn that the society sustains a reading room, although how extensive a one I was not informed, and pays its only salary (\$125) to a secretary.

43. It is not at all impossible that these notes may have already outgrown the interest and the patience of others, to whom they can only come as the dry record of facts and details, by no means as connectedly thrown together as they might have been, and not as items from the living recollection of a summer passed most pleasantly in jotting them down. But it is on the

other hand, equally certain that scarcely a beginning has been made upon the grand stores of information locked up in English Agriculture, the importance of which to the farmers of other countries, one only begins to realize completely when he has fairly entered into their midst, and, like Aladdin in the magic cave, laden himself so heavily with the precious materials there placed at his command, that he can scarcely carry away with him the half of his treasure. It is within the range of probabilities that the whole circle of those to whom these sketches may come, would not thank me particularly, if I should put it seriously into the heads of the younger portion of it to get a glimpse of farming in Great Britain before they "settle down" for life; but, at the risk of incurring a solemn look on the part of the parent, I cannot forbear reminding the son, that a hearty young man with a turn for acquiring information and depending upon his own resources, can now take a pedestrian tour in the British Islands for much less expense than is generally supposed. My own time was so limited that I was forced everywhere to consult rapidity of passing from one point to another instead of cheapness, and sometimes perhaps at the sacrifice of much that might have been learned by the way; and, from individual experience, I am sorry that I can shed so little light upon this view of the subject. As to the time to be consumed, the period decided upon may of course vary with each individual's circumstances and wishes, the longer the better, if rightly occupied; one summer, even—say three months from the time of landing to that of re-embarking, or still better a summer with a part of spring and a part of autumn, would suffice to teach a young farmer of ordinary "Yankee" quickness, enough to be richly worth some self-denial for the attainment. I should say that for a party of two, three or four associates, mutually disposed to turn to good account the advantages of such a journey, this companionship would possess some advantages over a solitary excursion; but at the same time, if one pair of eyes see less than three or four pair, there is this advantage in being alone: you are thrown for society entirely upon the people among whom you are travelling; and they are always disposed I think, to be more communicative and more hospitable when a single stranger chances in their way—of course supposing him to pay a proper regard in his demeanor to the opinions and customs of those from whom he is attempting to acquire information.

44. I wish, in drawing the whole subject to a conclusion, that it were possible for me to place before the reader such a parallel between English Agriculture and American Agriculture, as might be presented by a candid and intelligent farmer equally intimate with both. I wish that those facts which I chanced to gather in what I saw of the former, might have been so disposed as to serve more lucidly and more completely to exhibit at least one half of such a parallel—or perhaps I should rather say such a contrast, between the two kinds of husbandry; in order that those who are familiar with our own might put their knowledge of it side by side with the statements I have given, and, from their own comparisons, as well as from the deductions I have endeavored to track out as we were passing on,

that a deeper impression might have been obtained of those great truths which, as I conceive, the position, the aims and the processes of English Agriculture are so well fitted to convey.

The reader might then have been convinced, more thoroughly, unless I much misinterpret my own observations—of the advantages we enjoy as a nation—agriculturally not less than politically. *Politically*—because he would have arisen from his task with a better appreciation of that inheritance—shared, even approximately I am inclined to believe, by no other people, that inheritance of civil, social and religious liberty, of which I wish that we might speak less boastingly and perhaps less frequently, but more reverently and gratefully when we do, and in the higher and more worthy estimate of which no man—of all the classes and pursuits into which we are divided, has reason to feel a nearer and dearer concern, than the Farmer. *Agriculturally*—because I think if he could duly weigh the respective circumstances under which this pursuit is conducted there and here, he would find that our Agriculture *can* pay—nay, that here and there it *does* pay, not only a price for the labor it engages, but also an interest upon the capital invested in carrying it on, higher than the average returns obtained in English Agriculture.*

Upon such an assertion as this, I am quite aware that one can venture only at some hazard; because, of a dozen men, in some or all respects equally well qualified to form an opinion upon the profits of our agriculture, no two would perhaps arrive at the same conclusion. Indeed, in remarking the system and method so prominent in the farming of our transatlantic brethren, we can but lament our great deficiency in anything like a practical comprehension of the value of *pecuniary accounts*, so kept as accurately to indicate the profit or loss upon every transaction in which the farm is concerned. The actual importance of such precision to the farmer is so great, that if possible it would be well to illustrate still more particularly the minuteness to which English farmers habitually carry their calculations, and which they find it a matter of urgent necessity to keep constantly in view.

The Future of our Agriculture must rest with ourselves; and, if we improve the opportunities we possess, this future cannot be otherwise than one of gradual amelioration and progress. Give the same knowledge of our climatic and other peculiarities that he already possesses of his own, to such an English farmer—I will not say, as Mechi with his wealth, or Horsfall with his individual tastes and means of conducting investigation, but to such farmers as those I had the good fortune to visit in Norfolk, in Lincolnshire, in Kent and elsewhere, and let him apply himself and his capital to farming here, just as earnestly, as he does at home, and no more, and it seems to me almost beyond the region of doubt, that the balance sheet he would annually prepare so carefully, would show, with every allow-

* It is possible that the low prices of produce during the past season gave a less favorable coloring than usual to the opinions as to the "profits of farming" in England, expressed to me by those farmers with whom I had the opportunity of conversing upon the subject.

ance for probable contingencies, a return considerably greater in any of our moderately favorable farming districts, than it possibly can, higher prices and all in view, after the rent has been deducted for the English landlord, the taxes for the English crown, and the tithes for the English church—or for anybody that happens to have inherited the right of levying them.

45. This opinion, of course, should be received as it is given ; it appears to me to be warranted by a general view of the agriculture of the two countries, while, at the same time, I cannot pretend to support it with statistics—the definite record of ascertained facts—for there are none of our own agriculture, and few that are available here of theirs. The conclusion to which I was forced to come is this, that the improved English agriculture of our day—with that measure of perfect success it has achieved, and that measure of certainty that now attends its successes—has been merely a gradual and natural growth—some of the causes and features of which I have been attempting to indicate—out of a confusion far greater than that which now overhangs our own efforts after advancement ; that, even throwing aside entirely the advantages we have been deriving for twenty or thirty years from the mechanical skill of our inventors, the average character of our farming is now quite as intelligent and satisfactory as theirs was, at a period not very remote—bearing in mind, however, that England has possessed for half a century or more the same advantages (although not in a degree so great) which she now possesses, in her far greater wealth, her aristocratic predilections for country life, and her compact population, over the present condition of American agriculture.

So that it would be unfair to pronounce ourselves a score or two of years behind the farmers of Great Britain, without qualifying the verdict by adding that our backwardness, whatever it may be, is largely owing to the natural circumstances of our country, including, as I have before said, that lack of capital from which we have suffered in all pursuits, the distance of our markets and the low prices they have sometimes afforded, a sparsely populated territory, and a too general anxiety to get away from the farm, and live by trading or by our wits.

So that, moreover, there is room to derive encouragement and base new hopes upon the comparison, no matter how far in the rear we voluntarily rank ourselves at present, provided only we know that we are once fairly in the right road to equal or greater development ; and, if at length we should overtake and outstrip the mother country in the management and culture of our farms, it will not be the first time that we have schooled ourselves under her instruction, until the pupil—although it is perhaps scarcely becoming in him to say so—has actually excelled the instructor.

ALBANY, N. Y., *February, 1860.*

NEW YORK STATE AGRICULTURAL COLLEGE.

CHARTER, ORDINANCES, REGULATIONS AND COURSE OF STUDIES, 1859.

OFFICERS.

President: M. R. PATRICK, N. Y. Ag. College, Ovid, Seneca Co., N. Y.

Chairman Board of Trustees: Hon. JOHN A. KING, Jamaica, L. I.

Secretary Board of Trustees: BENJ. P. JOHNSON, Albany.

Treasurer: ARAD JOY, Ovid.

Counsel to the Board: Hon. JOHN E. SEELEY, Ovid.

Executive Committee: Samuel Cheever, Henry Wager, Alex. Thompson, Arad Joy, James O. Sheldon.

Finance Committee: Henry Wager, J. B. Williams, A. A. Post.

Building Committee: Henry Wager, Alexander Thompson, Benj. N. Huntington.

Farm Committee: Henry Wager, Alexander Thompson, James O. Sheldon.

Architect: S. E. Hewes, Esq.

Professor of Agricultural Chemistry, Botany, &c.: Prof. William H. Brewer.

Trustees: Hon. John A. King, Jamaica; Hon. William Kelly, Rhinebeck; Hon. Henry Wager, Western; Hon. B. P. Johnson, Albany; Hon. William Buell, Rochester; Joel W. Bacon, Esq., Waterloo; Hon. Abraham A. Post, Flint Creek; Hon. Addison Gardiner, Rochester; Hon. J. B. Williams, Ithaca; Alexander Thompson, M. D., Aurora; E. P. Prentice, Esq., Albany; Maj. M. R. Patrick, Ovid; Hon. Samuel Cheever, Waterford; Arad Joy, Esq., Ovid; Rufus K. Delafield, Esq., New York; James O. Sheldon, Esq., Geneva; Hon. Benj. N. Huntington, Rome.

AN ACT

To incorporate the New York State Agricultural College.

PASSED APRIL 15, 1853.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. John Delafield, Henry Wager, B. P. Johnson, William Kelly, John A. King, N. B. Kidder, Joel W. Bacon, William Buell, Tallmadge Delafield, Robert J. Swan, and such other persons as shall or may be associated with them for that purpose, are hereby constituted and created a body politic and corporate, by the name, style and description, of the

"NEW YORK STATE AGRICULTURAL COLLEGE," and the said corporation shall have and enjoy all the corporate rights and privileges enjoyed by any incorporated college in the State of New York, and shall be subject to the provisions and exercise the powers and duties contained and set forth in the second article of the fifteenth chapter, title one, of the Revised Statutes.

§ 2. The farm and grounds, belonging and attached to the said College, shall consist of not less than three hundred acres.

§ 3. The plan of instruction shall embrace the following branches of knowledge: Practical and scientific agriculture; chemistry and its manipulations, so far as it may be usefully connected with agriculture; mathematics and mechanics; surveying and engineering; geology and botany; the practical management of the farm, of the dairy, and of the various kinds of live stock; also such other branches of knowledge as may be deemed useful and proper.

§ 4. The persons named in the first section of this act shall be and form the first Board of Trustees.

§ 5. This act shall take effect immediately.

AN ACT

To amend an act entitled "An act to Incorporate the New York State Agricultural College," passed April 15, 1853.

PASSED FEBRUARY 5, 1857.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. The Trustees of the New York State Agricultural College are hereby authorized to increase the number of Trustees of said College from time to time, if they shall elect so to do, provided that the whole number of Trustees shall at no time exceed twenty-four.

No such increase shall be valid unless a resolution to that effect be passed at a regular meeting of the Board of Trustees, at least thirty days prior to the time of making such increase, nor unless the Secretary or other authorized officer of the said Board shall give notice in writing to each Trustee, in the usual manner, of such proposed increase, nor unless a majority of all the Trustees then in office shall vote in favor of such increase.

§ 2. This act shall take effect immediately.

BRIEF HISTORY OF THE COLLEGE.

Soon after the passage of the act of incorporation, Mr. John Delafield, of Seneca county, who had devoted much time and efficient service in procuring the act of incorporation, and much and most valuable service in the cause of agriculture in the State, was unanimously elected President of the College. He, with the aid of the other trustees, made considerable progress in obtaining subscriptions to the stock, when, in the fall of 1853, he suddenly died. His death, a severe loss to the agricultural interests of

the State, was most severely felt by his associate Trustees, and for a time almost paralyzed their exertions.

In 1855, the people of Ovid, in the county of Mr. Delafield's residence, made an effort to obtain subscriptions to the stock for the College, with the expectation that, if successful, the Trustees, in locating the institution, would properly appreciate their efforts. A subscription was obtained, mostly in that vicinity, to the amount, together with that obtained by Mr. Delafield and his friends, of more than forty thousand dollars, for a College to be located at Ovid. They, through the agency of the Rev. Mr. Brown, Principal of the Academy at Ovid, and with the aid of the friends of the enterprise from different parts of the State, procured the passage of the act of 1st March, 1856, the first section of which provides that when the Trustees shall certify to the Comptroller that they have located said College in the county of Seneca, and have purchased a suitable site for it, with three hundred acres of land, and have obtained valid subscriptions to the stock to the amount of forty thousand dollars, which is paid or secured to be paid to the satisfaction of the Comptroller, and shall mortgage the land to the State, that the Comptroller shall loan to the Trustees the sum of forty thousand dollars, for twenty-one years, without interest, out of the income of the United States Deposit Fund, not otherwise appropriated, "to aid in the payment for lands so purchased, and in constructing suitable buildings thereon for the uses and purposes of said College," &c. This act was amended in 1857, and provision made for advancing the money from the treasury generally, the Deposit Fund failing to supply the amount.

Although the establishment of such an institution for the education of the farmer and others had long been determined upon by the friends of agriculture in the State, this liberal and timely subscription to the stock, at Ovid, has enabled the Trustees to bring it into being at an earlier period than could probably otherwise have been done. In view of all the premises, they have located it in the town of Ovid, on the east side of Seneca lake, and have purchased, in all, about seven hundred acres of land for its purposes.

The farm is upon the western slope of the county, bounded west by the Seneca lake, and persons may leave Albany or Buffalo in the morning, and by the way of Geneva, reach the farm the same day; or New York or Buffalo in the afternoon, and, by the New York and Erie road and the head of the lake, reach the farm the following morning. The spot selected for the College is one commanding a view of great beauty and grandeur, taking in the town of Geneva and more than twenty miles of the lake, and the whole eastern slope of the county of Yates and part of Ontario. Still, the spot is retired, and the Trustees think none the less desirable, for that cause, for the purposes intended. It is easy of access from any part of the State.

All persons will concede that if an Agricultural College has attached to it a farm, either for purposes of experiment, illustration, or means of employment to students, it is of the highest importance that it should possess

the greatest variety of soil possible. The Trustees of the New York State Agricultural College felt the *vital* importance of this matter, and only made the selection they did after much deliberation. Had they selected a farm having no variety of soil, however fertile it might have been, or how complete all its other qualifications were, the general feeling would be that it was unfit for its purpose, or at least ill adapted to it. An article on the general features of the Botany of this farm, by Prof. W. H. Brewer, indicates the varieties of its soil and its adaptation to the purposes for which it is designed.

The farm is about two and a half miles long, and extends east from the shore of Seneca lake, the eastern end lying on the ridge between the lakes, and has an elevation of about 550 feet greater than the western, the slope being gradual and the exposure to the west. A small stream, having its sources mostly beyond the farm, runs through it to the lake. It is bordered in some places by dry grain land, in others by a narrow swale, while nearer the Lake it sinks into a deep, rocky ravine. The immediate banks of the Seneca lake form low bluffs, from the top of which the land rises gradually to the extreme eastern end of the farm at Ovid village.

The rock underlying the soil at the western end of the farm, and which crops out at the lake shore and in the ravine, is a soft shale, the "*Moscow shales*" (of Prof. Hall, in his reports on the Geology of New York), belonging to the upper part of the "*Hamilton group*." On this lies the "*Tully limestone*," an impure limestone, having a thickness on the farm of about eleven feet, half of which is sufficiently compact for building purposes, and is burned for lime, which is being used in the construction of the College buildings.

Above this lies the "*Genesee slate*," which underlies the upper part of the farm, or at least two-thirds of the land. This last is a slaty sandstone, very variable in both its chemical and physical characters,—varying from shale and slate to slaty sandstone, and even compact sandstone, thin strata of which are compact enough for building purposes, and indeed on the extreme upper part of the farm it has been obtained for this use.

The rock, in places, has each of these characters, and varies by all possible mixtures and proportions of these; hence, by its decomposition, forms some of the most fertile lands of the State. No better proof of this is needed than the fact that a large part of what is known as the "*Genesee country*" of central and western New York, a region of world-wide renown for its fertility, lies on the same geological formation, having precisely the same physical and chemical characters.

These varied characters of the underlying rocks, combined with other causes, give great diversity to the soil; there are consequently on the farm, very dry soil, rather wet soil, thin soil lying near the rock, deep and rich soil, soil poor in organic matter and soil black with organic matter, sandy loam, clay loam, stiff clay, brick clay, hard gravel, &c., the details of which can only be made intelligible by a map.

be two hundred dollars per annum, one-half of which sum must be paid semi-annually in advance.

DISCIPLINE.

In the administration and management of the college and farm, order and system should prevail, and as obedience and subordination are essential to the welfare and prosperity of the College, and to the comfort of all connected with the institution, the students, and every person employed by the corporation, will be required to obey the president, professors and teachers, or other officers. Any refractory or disrespectful conduct will be punished according to the degree of the offence.

GENERAL COURSE OF STUDIES.

FIRST YEAR.—SUMMER TERM.

English language, Arithmetic reviewed and completed, commencement of Algebra, and principles of Chemistry, Mineralogy, Geology, and Botany.

(English language and these elementary studies will be carried on during the term, with mathematics. Although this is *not intended to be a manual labor school*, still, the students will be required to spend such time in the field as may be necessary to apply the Theory to the Practice of Husbandry. Therefore—

The Freshman during this term will be instructed in plowing, spading, care of hoed crops, gathering hay and grain crops, management of the dairy, &c.

WINTER TERM.

Algebra completed, Chemistry, Mineralogy, Geology and Botany continued; Geometry, Drawing commenced.

(The Freshman class during this term, to be instructed in making and preserving manures, care and feeding of store animals, root and stock grafting, taking and preserving scions, &c.)

SECOND YEAR.—SUMMER TERM.

Trigonometry, Analytical Geometry, Surveying, Construction of Roads, &c., Agricultural Chemistry, Mineralogy, Geology and Botany continued, Outlines of Comparative Anatomy, Vegetable Physiology and Drawing.

(Practical Instruction to the Juniors—in sowing grain, planting, gardening, setting trees and shrubs, making fences and walls, draining and irrigation, training, pruning, grafting and budding, handling teams, loading wagons and carts, collecting specimens of plants and minerals, &c.)

WINTER TERM.

Descriptive Geometry, Engineering, Carpentry, Bridges, &c., Natural and Experimental Philosophy, Agricultural Chemistry, Mineralogy, Geology and Botany reviewed, Human Physiology, Zoology and Comparative Anatomy continued, Principles of Veterinary Practice, Book-keeping, Drawing, Farm Implements, Machinery, Architecture, &c.

(Practical instruction in fattening, breeding, and rearing stock, training

steers, handling cattle, training colts to saddle, harness or draught, preparing timber for fences, posts, &c.)

THIRD YEAR.—SUMMER TERM.

History of Literature, General and Agricultural; Physical Geography, &c., Intellectual and Moral Philosophy, Rhetoric and Logic, Constitution of the United States and of the State of New York; Laws of New York relating to Contracts, Highways, Fences, &c.; Book-keeping applied to the Farm; Entomology, Ornithology, Acoustics and Optics.

(The Senior Class to make up Topographical maps, from their own and other surveys, with reference to draining, irrigation and landscape gardening; examine and collect botanical, mineralogical, anatomical, and entomological specimens for winter analysis, Essays, Lectures, &c.)

WINTER TERM.

Astronomy, Electricity, Magnetism, Meteorology, Intellectual and Moral Philosophy, (including evidences of Christianity and Natural and Revealed Religion,) Rhetoric and Logic continued, Veterinary Practice; Drawing of Animals, Landscape, Composite, &c.)

(The Senior class to continue experiments in the Chemical Laboratory and prepare essays on any subject that may be designated by the Faculty. They will also take charge of *all experiments* in fattening and feeding Stock, &c.)

THE FARM.

It is intended to divide the Farm into two divisions—one, to be the special sphere of the *Juniors*; the other, of the *Freshman* Class.

It is intended that reduced maps shall be struck off from the Topographical map of the farm, of which each student shall have one, and be required to keep a record of his labors on *his own half*—cost, productions, value, and all the data for making a complete report at the close of the year. In this way each student becomes thoroughly acquainted with the character of every portion of the farm, *before* entering the Senior class.

During the last term of the graduating class, they will be required to prepare from their maps and field notes, above mentioned, plans for laying out the grounds—having reference to aspect, soil, location, &c., with accompanying essays upon the cultivation and management of the whole farm, not only with an eye to pecuniary profit, but to rural beauty and effect of landscape.

STUDENTS FOR LIMITED PERIODS.

It is probable that many young men may desire to attend the institution for limited periods, to avail themselves of the facilities afforded them for instruction in agricultural science; and such students will be allowed to fall in with the regular classes in recitation and instruction in the studies to which they wish to apply themselves. To organize a "special course" for irregular students, or for any other, indeed, would require an extra

force of Professors ; the "regular duties" of Professors on the "College course" being quite as much as can be attended to successfully.

The President and Professors of the College will, as they may deem it important for the benefit of the Institution and the students, suggest modifications of the course of studies, and submit the same to the Trustees, that the instruction may in all respects be such as to accomplish in the most thorough manner the results for which this Institution was founded.

ORDINANCES.

First. The government and management of the College shall be under the direction and control of the President of the College, who shall be responsible to the Trustees for the general management and well-being of every department; all matters of discipline and arrangement shall be under the control of the President, and all professors, teachers, officers, pupils, and other persons employed, shall be under his supervision and direction.

Second. Professors shall be appointed by the Board of Trustees to fill such departments as the Trustees may deem expedient. The Professors shall, in conjunction with the President, superintend vigilantly the moral conduct, industry and progress of each student, and other persons employed in the College or on the farm. The Professors shall, as often as may be required by the President, report to him the condition of their respective classes in such form as he may from time to time direct.

Third. A Chairman and Secretary shall be elected annually to perform such duties as the act of incorporation or the action of the Board may require.

Fourth. A Treasurer shall be elected by the Trustees. It shall be the duty of the Treasurer to hold and carefully preserve all bills, notes, bonds and mortgages, or other evidences of debt, or obligations or securities for personal or real estate, belonging to or held by the College; he shall receive and deposit in bank all moneys received from any source for account of the College. He shall pay all drafts or orders on him, made by the Chairman of the Finance Committee, which drafts shall always be drawn payable to the order of the said Treasurer, and be specially endorsed to the party entitled to receive the amount expressed in such draft or order; he shall prepare, and present to the President on the first day of every month, a full and detailed statement of all moneys received and paid by him for or on account of the New York State Agricultural College, and exhibiting the true balance of cash on the said last day of each month.

Fifth. A Finance Committee, consisting of three members, shall be annually elected by the Board, whose duty it shall be to audit all accounts against the college, and to invest upon approved securities any surplus money belonging to the institution, and generally to supervise its finances.

Sixth. On or before the tenth day of January, in each year, a report shall be prepared by the trustees, stating their proceedings, operations and expenditures, and including the last day of December then passed; the

management of the farm ; progress of the students ; also setting forth suggestions for the improvement of the institution, if necessary.

Seventh. In case the number of applicants for admission of scholars to the institution shall be greater than can be received, a preference shall be given to the application of those who have subscribed to the funds of the College, provided due notice thereof be given to the President.

The Trustees feel, in submitting to the public the outline of the course of instruction and management of the College, that a great responsibility rests upon them. The subject of an institution for the instruction of the sons of farmers and mechanics, and others, in the great work before them, is as yet in a great measure untried in this country ; though, as far as the institutions now in progress report, there is every reason for encouragement. Upon the manner in which this institution, as well as others to be put in operation, shall be conducted, much depends. That an institution may be so conducted as to be the means of doing great good, and of securing the co-operation and cordial support of the farmers and mechanics of our State, we have great confidence. We shall have to meet the ardent expectation of many who will expect that a single year's operation will show great practical results ; and others will expect, it may be, that experiments of the most important character will be exemplified at once, on the institution being put in operation. To such we would say, the work connected with an agricultural institution must, of necessity, require time to develop all that can be done for the proper instruction of the students, and for the satisfactory development of facts, which are to be ascertained from long continued and well conducted investigations and experiments ; and while we feel assured that a single year of instruction will be most valuable to every industrious and thorough pupil, yet we cannot disguise the fact that a series of years must be required to fully develop the inestimable value of an institution like this.

The Trustees believe that the course of studies, a general outline of which is given, will be thorough and practical, so that every student shall be enabled properly to understand the great principles connected with agriculture in its every department, and how, practically, to apply them in the management of the farm. It shall be their aim to select, as instructors, those who are competent to give such instruction, so that no portion of the work necessary to be understood shall be overlooked, and all who pursue a thorough course of study shall be able to carry out all the principles and practices deemed necessary and important for the farmer.

To gentlemen interested in advancing the great interests of our country, as well as to the farmers and mechanics of the State, the Trustees look with confidence for the support of the institution, and trust they will see the importance of sustaining the institution by their contributions to its funds, as well as by sending to its halls their sons to be educated in a manner which shall not only increase their usefulness, but place them in a position equal to the educated men of other pursuits.

The President of the College, as well as the Trustees and such agents as

may be employed, will present to the public the subject of funds. The Trustees appeal to all professions to advance the only institution in our State which is solely designed for the purpose of furnishing an education suited to the wants of the great majority of our young men. It is believed that the great interests of practical education can in no other institution be more fully promoted than in this.

The Trustees will be pleased to receive from the various Agricultural Associations in our country, their Transactions for the library of the institution, and from others such works as may be useful to the institution.

Students, contemplating joining the institution, will be furnished with every necessary information by applying, personally or by letter, to M. R. PATRICK, President of the college, Ovid, Seneca county, N. Y.

ANNUAL REPORT OF THE TRUSTEES OF THE NEW YORK STATE AGRICULTURAL COLLEGE.

To the Honorable Legislature of the State of New York:

In obedience to the requirements of an act of the Legislature, passed on the 31st of March, 1856, the Trustees of the New York State Agricultural College, present their third annual report:

The history of this enterprise, from its first inception, is briefly recorded in various legislative documents, from the date of its act of incorporation, on the 15th of April, 1853, to the 24th of March, 1858, when its first annual report (Assembly Document, No. 184) was transmitted to the Legislature by Mr. President Cheever, and embraced the operations of the Board from the date of their charter, with an outline of their plans for the future, and some general remarks upon the location, capabilities, and characteristics of the College Farm.

The report of Mr. Secretary Johnson brings the history down to March 1, 1859, (Assembly Document, No. 118,) at which time, by the resignation of Judge Cheever, on the 30th of June preceeding, the entire management of the affairs of the institution was in the hands of various special committees of the Board, who have them still in their charge.

The duties of these committees, composed of gentlemen residing in different and distant parts of the State, have been cheerfully performed, at a heavy expense to themselves of time and money. Especially has this been true, with respect to the farm and building committees.

The Hon. Henry Wager, of Oneida, chairman of both these committees, has spent a large portion of his time here, for the last eighteen months, and has had the control of the farm, directing its operations, through the foreman, Mr. R. G. Wands, with very satisfactory results, although some of the crops were not put in as early in the spring as was desirable, Mr. Wager being absent in February, March and April, on the Pacific coast.

The wheat crop, (of which but little was sown last spring) was light, and
[AG. TRANS.]

the corn did not thoroughly ripen, a fact equally applicable to the corn crop throughout this portion of the State, resulting from the frosts of 2d and 3d of July, and the peculiar character of the whole season.

Next season the farm work will commence earlier, as there has been preparation made for it, by the plowing of seventy acres of sward land, for spring crops, and the sowing of thirty-five acres with winter crops—(seventeen of winter barley, and eighteen of Mediterranean wheat.) Both the barley and wheat are now looking well.

Products of the Farm for 1859.

- 200 tons of hay, of good quality.
- 200 bushels of wheat, Rio Grande and Club, (Rio Grande best.)
- 162 bushels of barley, very good.
- 1,200 bushels of oats, sound and heavy.
- 300 bushels of sound corn.
- 500 bushels of soft corn—fed and feeding to animals.
- 800 bushels of potatoes, mostly of Peach Blows, but including 70 bushels Purple Chili, 120 bushels Oregon, and some other varieties.
- 4,000 pounds of pork, from 17 swine, packed and cured for use.
- 1,800 pounds of beef, from three cattle, packed or sold.
- 400 pounds of lard, and 300 pounds of butter, now on hand.

Stock on the Farm January 1, 1860.

- 6 horses (4 extra heavy team,) 2 others, good common.
- 1 horse colt of last season.
- 1 yoke of working oxen, will be 7 years old next spring.
- 2 milch cows, do 7 do do
- 1 milch cow, do 5 do do
- 12 milch cows, do 4 do do
- 11 heifers, do 3 do do
- 5 heifers, do 2 do do
- 10 calves, do 1 do do
- 9 steers, do 3 do do
- 2 steers, do 2 do do

64

Feeding, to turn off for beef.

- 2 oxen will be 8 years old next spring.
- 1 steer, do 5 do do
- 5 steers, do 4 do do
- 1 steer, do 3 do do
- 1 heifer, do 4 do do

10

Also :

1 grade Short Horn bull, coming 2 years old.

1 pure blood Short Horn bull, "Justice," coming 2.

In all, 66 head of horned stock.

180 sheep, (about one-half of them low-grade Merino and Saxon.)

20 swine, (2 pure Yorkshire and Suffolk boars included.)

Since the last annual report was made, Mr. R. G. Wands has presented to the Board, for the farm, a young Suffolk boar ; Hon. A. B. Conger, of Rockland, has presented a superior South Down buck, and Jas. O. Sheldon, of Geneva, a fine South Down buck lamb. From the use of these animals, and those previously presented, the stock on the farm is rapidly increasing in value.

The trustees have also received since their last report, of R. L. Howard, of Buffalo, a mowing and reaping machine ; of J. E. Morgan, of Deerfield, Oneida, a premium lumber wagon ; of Messrs. Herring, of New York, a large iron safe (in part ;) and of R. G. Wands, foreman on the farm, Titus' iron beam plow.

Other donations, some of them valuable, have been made, with a request that the names of the donors might not be made public.

With the exception of a few articles, such as hay scales, circular and cross-cut saw mills, for horse power, &c., the farm has a supply of implements and machinery for present purposes, many, and indeed the larger portion of them, the gift of the manufacturers, whose liberality to us has been largely repaid by the increase of orders for "more of the same sort."

Nor is this an unwise investment on the part of manufacturers, as large numbers of farmers and farmers' sons are, every year, examining closely the implements here used, the manner of working them, and their comparative merits. And this will continue to be the case, in still greater degree, as the institution increases its operations. Students becoming accustomed to the use of certain tools, machines, and implements here, the probabilities are, that they will order the same for their own farms.

To all those gentlemen who have so handsomely contributed to the outfit of the College Farm, the trustees return their hearty thanks, and the assurance that these contributions shall be used in the attainment of results that shall benefit all classes of community.

To accomplish the results aimed at by the trustees, in regard to the farm, time, and labor, and some money, as well as skill, intelligence and perseverance are requisite. The tract known as the "College Farm," consisting of about 720 acres, embraces what constituted four entire farms, and parts of several others.

To reduce the management of such a tract to a perfect system, is the work of some years. Thus far, the management of this farm has been as economical as that of any private individual, under similar circumstances ; and the work accomplished is more than could have been expected, where the laborers were liable to be called off, at any moment, to perform servi-

ces connected with the operations of building, or the like, beyond legitimate farm duties.

A plan for laying out the whole farm, including the College grounds, location of roads, bridges, &c., has been maturing for more than a year, in the hands of Dr. Alex. Thompson, of Aurora, to whom the work was committed by the Board, and who has spared no pains in acquiring information bearing on this subject; having visited such places, in Britain and France, especially, as would be likely to suggest ideas useful to him in this important work.

A plan once adopted, after such mature deliberation, will be carried out, persistently, by the Board, from year to year, as circumstances will permit.

For the present, and to meet existing wants, it is proposed, early next season, to gather the various barns, sheds, and other buildings now scattered over the farm, at a convenient and central position, where they can be so arranged as to form a cheap, but convenient farmery, and where the work can be advantageously performed. The position has already been selected, and is near enough to the College for the students to avail themselves of its advantages.

A large portion of the farm would be greatly benefited by thorough draining, but as yet, only some hundreds of rods have been laid, owing to the pressure of other business. It will, probably, be a year or two before this business can be undertaken, to any extent; certainly not until the buildings are completed and the College opened. Once commenced, it will be systematically carried out, the facilities for draining being unsurpassed, the lands falling off in three different directions, amply sufficient for carrying off the water without choking.

Clay of the very best quality (the same from which the brick for the College were made,) is found in abundance near the spot selected for the farmery, and from this, tile can be manufactured to any extent.

Lime, too, of unusual strength, has been burned only a few rods from the brick yards, and has furnished the material for all the mortar used in building. A 600 bushel lime kiln belongs to the farm, and lime has been spread on some of the lands needing it, this winter. It is cheaply obtained, and the fallen, dead and decayed wood of the farm, will suffice for the burning of many kilns, both of lime and of brick, without disturbing the more valuable timber.

The principal portion of the wood lands lie in a solid body, heavily timbered with oak, beech, maple and ash, interspersed with a few trees of bass, black walnut and pine. Dense masses of evergreens, young hemlocks, pines and cedars, clothe the borders of the ravines, the shore of the lake, and broken grounds along the water courses.

Of the 175 acres in wood, there is a tract near the main road, and extending south, that is but sparsely timbered, and almost exclusively with large oaks. The report of 1858, announces the unwelcome truth, that some of the largest of these oak trees (as well as those all through this

section of country,) had died, or were at that time in a dying condition ; supposed to result from the dry seasons of 1854 and 1856.

It may not be improper, however, even in such a paper as this, to suggest that the conditions under which these oaks were grown and assumed their normal character, have been essentially changed within a comparatively few years. The dense underwood that once shaded their roots and preserved to them a constant moisture, has been cleared away. The fierce rays of summer suns, pouring in without obstruction, bake the earth like brick, and the winds of winter, with no obstacle to oppose them, career among these scattered giants, lifting up and driving before them to deep ravines and denser woods, the snows, that, in bygone years, spread a warm mantle above the roots now freezing, now thawing, with every variation in the temperature of our variable climate.

Surely, these are causes sufficient to produce death in any season, and may well challenge the attention of those who desire the preservation of our forests, and forest trees, from almost certain death.

The attention of the Board was early called to this subject, and by stringent resolutions of that body, the cutting of any standing timber whatever, without authority of a committee for that purpose, was prohibited.

It is not too much to say, that the trustees regard it as an imperative duty, both by precept and example, sacredly to guard the few still living monuments of past centuries that rear their leafy heads at only widely distant intervals, throughout the older settled portions of the State.

A thousand years, with all the chances incident to tree-growing in this State, might never reproduce an oak to compare with such as are now standing, and which, with a little care, will stand for many generations.

Buildings.

On a commanding eminence, 583 feet above the lake, and about midway of the farm, in its eastern and western extent, rise the College buildings. In every direction the land slopes gradually away, and from the plateau in front, the eye takes in, at one broad sweep, the eastern slopes of Ontario and Yates counties ; the Seneca lake for more than twenty miles of its extent, with the town of Geneva in the distance ; and by ascending to the upper stories of the College buildings, large portions of Seneca, Wayne and Steuben counties are included in the view.

In the summer of 1858, a plan of building was adopted by the trustees, and it was decided to put up only a portion of the whole, until the condition of the finances should authorize the completion of the plan.

Accordingly, a contract was entered into, with Mr. Thomas Crawford of Geneva, for the erection of the south transverse and adjoining lateral wing, embracing about one-third of the entire plan, and capable of accommodating from 125 to 150 students, with the necessary rooms for lecturers, professors and officers of the College.

On the 15th September, 1858, the excavations for the foundations were commenced, and before the close of the season the basement walls were

raised above the level of the earth. On the 1st of April, 1859, the work was resumed, and on the 7th day of July following, the corner stone was duly laid by the Hon. John A. King, Chairman of the Board of Trustees, in the presence of a vast concourse of people, who had gathered to testify their deep interest in the cause to which the structure is dedicated.

Since that time the work has gone forward as rapidly as safety of construction and the funds of the corporation would permit. At the present time, the work of plastering is going on, and the general operations of inside "finishing off."

Without going into the details of the building, it may be well to say, that the transverse wing is 128+58 feet, and four stories high, above the basement; that the lateral wing is 60+84½ feet, and three stories high, above the basement; and that halls extend, lengthwise, through either wing, ten feet in width.

On each side of the halls of the lateral wing, on each floor are six rooms: 36 in all; and on each side of the halls of the transverse wing, are six rooms: 48 in all. These 84 rooms are all of the same size, 12+14 feet, with bed rooms to each, of 11½+7½ feet. The ceiling of each story is 11½ feet in height. Every apartment is well ventilated, has its own register for regulating heat, and arrangements for lighting with gas.

Under the whole building extends a well lighted basement, with kitchen, dining room, wash room, store rooms, President's office, and other rooms appropriated to various purposes.

The building is well heated, even now, in its unfinished state, by two of Boynton's No. 11 furnaces in the lateral wing, and four of his No. 10 furnaces in the transverse wing. These are well set in masonry, and under the arches of the hot air chambers, is storage for a year's supply of coal.

Water is now running to the College, and supplies all the wants of the builders, from a spring on the eastern division of the farm, 460 rods from the edifice, and 70 feet above its basement. It is brought in cement pipes, and will be introduced into every part of the building.

All the stone used for foundation and basement walls (excepting dressed stone for external appearance) were quarried within half a mile of the College, and near by the kilns which supplied all the lime and brick used in the whole structure.

With these facilities for building, the work has been done at an exceedingly low rate. At the present time the contractor has expended about \$33,000, and it will probably require not far from \$8,000 more to complete the job, including the basement, which was not a part of the original contract, but is necessary for us.

Up to this date, Mr. Crawford has received on contract,	
In cash and lumber purchased for building,.....	\$17,536 61
In stone, house rent, farm produce, &c.,.....	2,463 39
Total, or thereabouts,.....	<u>\$20,000 00</u>

Leaving about \$23,000 to be paid for the completion of the College edifice.

Treasurer's Report, 1859.

Arad Joy, Treasurer. Report from Dec. 31, 1858, to Dec. 31, 1859.		
Received, within the year, from sales from the farm,.....		\$600 00
do do staves sold,.....		701 11
do do fat steers sold,.....		900 00
Collected on notes, (subscription to College,).....		2,251 12
Received in donation from Hon. John A. King,		500 00
do do Wm. Kelly,.....		500 00
do do B. N. Huntington,		100 00
do do J. B. Williams,.....		100 00
do do A. B. Conger,.....		50 00
do do Abm. A. Post,		100 00
do do A. H. Aspinwall,		100 00
Received from the State, per the Comptroller,.....		22,402 48
Advanced by Treasurer,		85 33
		<hr/>
		\$28,390 04

Disbursements.

Paid out for	hired help on the farm this year,.....	\$942 25
do	expensoe of conducting water to College,	600 00
do	draining on the farm,	80 64
do	family and farm house expenses,	223 89
do	painting, repairs, gates, &c.,	205 82
do	freight, storage and sundries,	134 00
do	stove, elod crusher, bags and furniture,.....	189 21
do	horses, stock and sheep,.....	805 30
do	blacksmith and harness maker,	70 78
do	chopping wood,	61 81
do	repairs on saw mill and sawing,.....	28 71
do	insurance on \$2,500, one year,....	8 68
do	seed wheat,	35 00
do	repairs and expense on mowers and reapers,	14 86
do	architect, S. E. Hewes,	450 00
do	real estate,.....	7,614 11
do	building to Thomas Crawford,.....	16,536 61
do	miscellaneous,	228 37
do	Van Benthuyzen, printing, (old debt,)	160 00
		<hr/>
		\$28,390 04

On the "Ovid subscription," as it is called, of (\$40,000) forty thousand dollars, (\$32,500) thirty-two thousand five hundred dollars has been received and paid out: \$1,000 is to be paid in nursery stock, and \$500 in other

than cash, leaving (\$6,000) six thousand dollars due in May next, in cash, from the bond signers.

To meet their liabilities for the completion of the College buildings and preparing them for the reception of students, the Trustees look, with unabated confidence, to men of wealth throughout the State, to farmers, mechanics, professional men, and all others who have sons to educate for agricultural pursuits, or who are interested in the cause of education, for money to complete what has so auspiciously begun, and which has been carried, thus far, by a few men who have devoted themselves and their money to the work; again and again advancing their own funds to meet the exigencies of the Institution.

It has been the cherished hope of the Board, that their call for funds would be so responded to, that a class of thirty or forty young men might be received, and the College commence its course in April or May next.

With that expectation, the Board elected to the Presidency of the College, on the 23d of September last, the present incumbent, to arrange a course of instruction and secure Professors for such commencement.

But unless their efforts shall hereafter be crowned with better success than they have been of late, these hopes must be given up, and the numbers of young men who have long since applied for admission, be turned away and doomed to other pursuits.

Applicants for admission from other States than our own, are constantly increasing—over twenty such applications having been made by letter, within the last ten days.

To this institution the eyes of multitudes are turned, from every State of the Union. It seems scarcely possible, when so near the attainment of our object, that the needful amount for completing the work should be wanting, in a State where so much wealth abounds.

With the hope that, before the next annual report to your honorable body shall become due, the Agricultural College of the State of New York may be in successful operation, dispensing the benefits of a sound education to the young men who will hereafter occupy positions of commanding influence in society and in the State, this report is respectfully submitted, in behalf of the Trustees.

M. R. PATRICK, *President.*

NEW YORK STATE AGRICULTURAL COLLEGE, }
OVID, January 10, 1860. }

REPORT OF GEORGE VAIL, ESQ., DELEGATE TO VERMONT.

TROY, *January 10, 1860.*

COL. B. P. JOHNSON,

Sec'y N. Y. State Ag. Society:

Dear Sir—In compliance with the appointment of the Executive Board of the New York State Agricultural Society, I had the pleasure of attending, as a delegate, the Vermont State Agricultural Society, which held its annual Fair and Show at Burlington, on the 13th, 14th, and 15th of last September; and in conformity to a request made by you, that it would be desirable I should *furnish* you with a report upon the subject, I now proceed to the performance of that duty. I arrived at Burlington on the evening of the 13th, and was kindly and cordially received by the Executive Board and members of the Vermont State Society, and was invited to meet them on the following morning, in the Floral Hall, on the Fair ground, and which invitation I complied with.

For the particular proceedings on that occasion, I refer you to the Burlington Daily Times, a copy of which paper you will herewith receive.

RECEPTION OF MR. VAIL.—A very pleasant incident of the Fair, yesterday, was the presentation of his credentials by Hon. GEORGE VAIL, of Troy, N. Y., as the delegate from the New York State Agricultural Society, to attend our State Fair.

At a little after nine o'clock, Mr. Vail, with the President of the Vermont State Society, Gen. Chase, and the Directors, together with ex-President Frederick Holbrook, Esq., of Brattleboro, and a considerable number of spectators, assembled in Floral Hall.

Mr. Vail thereupon presented his official letter of credence from the Secretary of the New York State Society, to Mr. President Chase, accompanying the presentation with an excellent and appropriate address, as follows:

Mr. President and Gentlemen of the Vermont State Ag. Society:

It affords me the greatest pleasure to appear before you this day, as a delegate of the New York State Agricultural Society, commissioned, as I am, by that noble institution, to tender to you, and through you, to the gentlemen composing the Vermont State Agricultural Society, their most cordial greetings, and their ardent desire for your continued success in

promoting the great interests of agriculture, within the bounds of your State.

The Society which I have the honor to represent, takes a few years precedence to that of yours. It was formed by a legislative enactment in 1832. Its successful career in performing the duties for which it was constituted has surpassed the most sanguine expectations of its warmest friends. The benefits it has conferred upon farming, and its kindred interests, are incalculable. Time, and the occasion, will not allow me to particularize. I cannot, however, forbear to remark, as a deserved tribute of gratitude to *your State*, that it has not been slow (as history will prove) in adopting and carrying out the suggestion, so graphically portrayed to it, in an address *written* by a native born citizen of your State, the late lamented Silas Wright, who was gifted in a high degree with a sound, discriminating mind, which could grapple with and render plain the most intricate subjects submitted to his consideration, and whose eminent services, as a statesman, conferred equal honor upon his adopted State, and this Union; he has left a name indelibly enshrined in the grateful recollection of his country. The address I allude to was read by his friend, Gen. Dix, at the Saratoga State Show, in 1847. The original draft of it is enclosed in a frame, and deposited in the archives of the New York Society's rooms. A printed copy of it you will find in the New York Society's Transactions of 1847, a volume of which I now have the pleasure to present to you, Mr. President, for the use of your Society. I quote a part of a paragraph from the address, which is in the following language:

"Agricultural production is the first in order, the strongest in necessity, and the highest in usefulness, in the whole system of acquisition. The other branches stand upon it, and without it, could not exist. Still, it has been almost uniformly, as the whole history of our State and country will show, the most neglected."

These words of wisdom have not been lost nor unheeded by the New York State Agricultural Society. It has been their constant aim, by all means within their power, to convey to farmers such information as is best calculated to stimulate to honorable competition, to excel each other in valuable improvements. How far they have succeeded in accomplishing this object, I need only refer you to the improved agriculture of the State, the annual published Transactions, their library, their collection of minerals, their variety of useful seeds, and their experimental farm. Much credit is due to their accomplished Secretary, Col. B. P. Johnson, for his efficient services, in all these departments, particularly in the admirable arrangement of their published Transactions, which are replete with valuable information, furnished by scientific men, and the best practical farmers. They are sought for and highly prized throughout the Union, in England, and on the Continent of Europe, and I should be rejoiced to learn that they had a place assigned them in the library of every farmer in this country.

I need not tell you, Mr. President, that the rearing of *good stock* has

become one of the most profitable branches of farming. To prove this assertion, I need only to refer you to what the farmers of your State have done in breeding horses; as they have earned an enviable reputation in rearing, by a careful, well-directed scientific course, the best horses for all *useful* purposes to be found in any of our States. The Black-Hawk, the Morgan, and others which might be named, possess a world-wide reputation, for their symmetry of form, fine action, and power of endurance. These noble animals are sought for with avidity by all who have a practical eye to discern, and a mind capable to discriminate and appreciate, the points which serve to constitute a perfect animal.

Thus much I can say, without flattery to Vermont farmers, and I believe I can say with equal propriety that New York has within its bounds many herds, of the different distinct breeds, of thorough-bred cattle, which cannot be surpassed for their good qualities, in the known world. This country has long been tributary to England for the improvement of cattle, and for the best of reasons, in that they have there, from a long course of systematic, scientific breeding, succeeded in bringing them to a state of great perfection, in symmetry of form, light offal, ripe points, and dairy qualities. These qualities being inbred, therefore their descendants are not likely to deteriorate. For there is truth in the maxim that "like begets like." The foundation for the herds alluded to in New York, have been, through individual enterprise, derived from the best herds in England, bred in the manner above alluded to.

I allude to these facts, Mr. President, in the hope that they may be heeded in the right quarter. I would then say to the farmers of New York, Look to Vermont for horses to improve yours; and to Vermont farmers, Look to New York for cattle to improve your herds. And thus an equal benefit will be conferred upon the respective States. There need be no fear that these two States can ever be overstocked with the description of animals alluded to—the demand from other States for improvement will always exceed the production of these two States. The history of stock-breeding in England will fully justify this conclusion, for as improvement has progressed there, the demand has increased, with a continued advance in prices, up to the present time.

Moreover, farmers have it perfectly in their power to put into successful operation, in this particular at least, the American system of home production, so much dwelt upon in former days by selfish politicians, who have always been found in every political organization.

This should teach the agriculturalists of this country, that while they are engaged in instructing their sons in all branches of husbandry, care should be taken that they receive an education to fit them for occupying the highest stations in the government of the country. Tell them vacillation and instability will pervade the action and measures of our rulers, to the neglect of the agricultural interest—which is the basis of our prosperity, and which gives vigor and life to every other branch of national industry, and without it, as I have before remarked, "they could not exist."

In concluding these brief and imperfect remarks, you, Mr. President, and all within the compass of my voice, will doubtless heartily rejoice in rendering thanksgiving to Him who governs and controls all things, in that He has crowned the labors of the husbandman, the past year, with unusual abundance of the rich products of the soil, which has filled our granaries to overflowing.

At the conclusion of this happy and courteous address, ex-President Holbrook, on behalf of the Vermont State Society, made a very neat and graceful welcoming reply. Addressing Mr. Vail, he spoke, in substance, as follows:

On behalf, sir, of the Directors of the Vermont State Agricultural Society, I offer you a hearty welcome as the delegate to our annual State exhibition from the State Agricultural Society of New York—a Society whose efforts to promote agricultural improvement are known and appreciated by agriculturalists everywhere, and whose published Transactions are considered as authority by agricultural societies, and by intelligent persons, throughout our own country, and in foreign lands.

Permit me, sir, also to welcome you as an individual, a citizen of our common republic, and to express to you our united and hearty thanks for your own earnest and most important efforts to improve the agricultural animals of the country by importations of cattle of the best blood in foreign countries, by your own scientific and very skillful breeding of the same on your own farm, and the dissemination of them throughout the country—the benefits resulting from which can hardly be estimated. We also thank you, sir, for the important influences derived from your example as a careful observer of the effects of crosses in breeding, and from your oft-repeated advice and instructions on the subject of improved stock raising to others, less informed in the matter than yourself.

We trust, sir, you may find your visit to us at this time a pleasant and interesting one; that you may return to your good home in safety and health, and that on future occasions of this character we may again meet, and enjoy an interchange of views and experiences.

I again tender to you, sir, a cordial welcome among us.

The Vermont State Agricultural Society was instituted originally by a few enterprising individuals at Middlebury, in September, 1851. There were no premiums offered nor paid by the Society until 1853. The Legislature of the State, after an application of five years, granted the Society an act of incorporation on the 8th of January, 1857. The Society was duly organized under the provisions of that act, and from this date its corporate existence commenced. This historic incident is here recorded, to show that much credit is due to the perseverance of the gentlemen who formed the Society, and also to show the inexplicable reluctance of our State Legislatures to encourage and promote this great leading industrial pursuit, which forms the basis of our national prosperity, while every other branch of industry receives their fostering care.

The show grounds at Burlington are extensive, and beautifully situated

on the margin of Lake Champlain, commanding an extensive view of that fine lake ; the different buildings for the reception of articles for exhibition were appropriately located. The stalls for horses, cattle and other animals were placed on the east side of the fair grounds, thus providing a place for everything, producing order, and affording visitors an opportunity to view and compare everything without confusion or interruption.

The exhibition of stock would do great credit to any State, and particularly that of horses, and I hazard little in saying that it was superior to any ever exhibited in any State in the Union, of these noble animals, for practical and useful purposes. In number they were 545. They were mostly young, being mostly of the Sherman Morgan, Woodbury Morgan, Bulrush Morgan, Hambletonian, &c. There were on exhibition 205 head of cattle, composed of Durhams, Devons, Herefords, Ayrshires, mixed and natives ; among the blood cattle, the Durhams and Devons predominated, and there were many fine specimens of those animals, indicating that there is a right spirit among the Vermont farmers, which will eventually place them in the front ranks among the several States, in breeding cattle.

Of sheep there were on exhibition 388, composed of French Merinos, Spanish Merinos, mixed Merinos, and long and middle wooled ; the Spanish Merinos predominated. I need hardly say that this State has long been celebrated for its lead in sheep husbandry, and the exhibition of fine animals on this occasion conclusively proves that the farmers of this State intend to persevere and bring this important branch of husbandry to its highest state of perfection.

Floral Hall.

This department of the exhibition was well and creditably sustained, proving that the ladies of Burlington and its vicinity are not behind those of our own State in cultivating and arranging the products of the flower garden. This department is always attractive, and no fair ground would be considered complete without it.

Dairy Department.

This department was well and largely represented ; butter and cheese were there in the highest state of perfection. This State has long been celebrated for its superior dairy productions ; of fruits and vegetables, it may be said, there was a very creditable display.

Mechanics' Hall.

The number of useful and improved agricultural and labor-saving implements of husbandry on exhibition were large, and well adapted to the objects they were severally designed to accomplish, which conclusively proves that the mechanics of Vermont possess ingenuity and skill not surpassed by those of other States, which serves to show they duly appreciate, and are willing to lend their aid to farmers in the onward progress of an improved husbandry. There was also a good exhibition of swine, poultry, &c.

In concluding this report, Mr. Secretary, I feel I should be derelict in

duty to the New York State Society, and to myself, did I not bear testimony to the hospitable and kind reception which I received from the honored President of the Vermont Society, Gen. Chase, the executive board, and many of its members with whom I was acquainted, and to whom I was introduced during the time I spent with them, giving the most gratifying assurance to the officers of our Society, that from the well known characteristic, manly and social qualities of our Vermont neighbors, that any delegate which our Society may hereafter send to them, will be greeted and entertained with the like cordiality which they extended to

Your humble servant,

GEO. VAIL.

NOTES AND OBSERVATIONS ON THE GRASSES OF AGRICULTURE.

W. DARLINGTON, WESTCHESTER, PA.

The New York State Agricultural Society having expressed a wish for the preparation of a work on "the herbage grasses of the State, which shall accurately describe all the species existing therein, in language, and with illustrations which shall be clear and intelligible to the farmer,—and which shall also describe such facts and circumstances in relation to them, as are desirable to be known in the practice of agriculture,"—the writer of the following remarks submits them, with diffidence, as the result of his observations and experience, for a number of years, on the farm lands of Chester county, Pennsylvania. In reference to the kind of work, above mentioned, as being useful to the farmer,—the writer would here say, that the most valuable account of the grasses he has ever met with, is entitled *Hortus Gramineus*,* by George Sinclair,—who prepared it under the direction of the Duke of Bedford. The work appears to have been faithfully executed, and quite reliable.

New York, in the Natural History of the State, possesses descriptions of all the known plants of the same (*grasses* included), by her distinguished and accomplished botanist, Dr. Torrey. A dozen years ago a small volume was published entitled "Agricultural Botany," enumerating and describing the useful plants and weeds, which merit the notice or require the attention of American agriculturists. The edition was limited, and is now quite exhausted; but a second edition "revised, with additions," by George Thurber, Esq., an able and accomplished editor, is now in press, by A. O. MOORE & Co., 140 Fulton St., New York. This will be speedily published; and perhaps (with the wood-cut illustrations,) may serve an useful purpose in the absence of more highly finished productions. If every young farmer would provide himself with fair, well authenticated *specimens* of every interesting plant which he finds on his premises, and keep the same duly labelled and arranged for convenient reference, in a proper *Herbarium*, he would soon become familiar with them all, by the aid of the cuts and descriptions; and thus be enabled to discuss their character understandingly. The "technical terms," spoken of in the paper which elicited these remarks, are employed in all the works above referred to; and for the reason that they, alone, convey the definite and precise ideas, which belong to intelligent conceptions of Natural Science. The *Glossary*, annexed, is always at hand to furnish the explanations, and refresh the memory. *Agricultural Directions*, for their management might have been

* This work is in the library of the Society.

added, as suggested; but it was apprehended they might render the work rather voluminous, especially as the directions would have to vary somewhat with the latitude.*

With respect to the *manures* best adapted to the grasses, the writer would remark that so far as observation and some years of experience enable him to judge, he is of opinion that scarcely any sort of well rotted manure comes amiss among that interesting family of plants. It may be added that in Chester county, the application of *lime* is regarded as an excellent treatment of grass lands, especially what is known as *top dressing*, viz.; fresh burnt lime slacked to a powder, and spread equally on *the sod*, at the rate of twenty to fifty bushels per acre, according to the condition of the soil. The farmers think, the richer the soil, the heavier may be the dressing of lime.† Calcareous soils (such as that of the great limestone valley of Chester county, Pa.) are said to admit of much heavier dressings of lime, than the land on the rolling hills of the Brandywine. Lime is known to have a salutary effect upon any soil in which there is a large portion of decomposing vegetable matter; and it seems to be well adapted to all the *grass family*, from Indian corn and the common *Cerealia*, down to the smallest species of *Poa*. Mere practical farmers differ, respecting the best time for cutting the grasses for hay: Some contend that it is better to let the *seeds* be fully grown, and nearly ripe, before the plant is cut, that the seeds render the hay more nutritious. They even claim that advantage for the common cultivated Timothy grass (*Phleum pratense*, L.) The truth of the matter might probably be ascertained by a careful experiment; but it seems more rational to suppose that *hay* which was prepared from grasses and other plants, at the moment when the *sap* was most replete with *sugar*, would contain the most nutriment, and consequently be the most valuable. Hence it is thought, that as saccharine matter is apparently most abundant at the time when plants are in flower, therefore, the best period for converting them into *hay*, is while the sugar is most copiously developed, whether in the *grasses* proper, or in the leguminous plants known as *clover*.

The usual rotation of crops in Chester county, Pa., brings each field, in its turn, into the condition of a *meadow*, for the production of hay. The hay crop commonly consists, mainly, of Red clover (*Trifolium pratense*, L.) and Timothy (*Phleum pratense*, L.) Those two plants afford a favorite and an excellent hay, though the Timothy is rather later in flowering. Some farmers prefer the Orchard grass (*Dactylis glomerata*, L.) to the Timothy, for the reason that the Orchard grass flowers simultaneously with the clover, and both are ready to be cut at the same time. Another recommendation of the Orchard grass is, that when cut, the radical leaves speedily grow up, furnishing an *aftermath* which protects the soil from the scorching summer sun; whereas the aftermath to the Timothy crop is very deficient. Nevertheless, habit or prejudice induces the Chester county

* This very valuable work by Dr. Darlington, is in the library of the Society.

† Lime is deemed especially valuable on soils in which a *stiff clay* predominates.

farmers, generally, to adhere to the culture of Timothy. Where the land is good, both Clover and Timothy are gradually choked out by the spontaneous growth of Green grass (*Poa pratensis*, L.), which "comes in," as the farmers express it, whenever the soil is rich, or highly improved, without the trouble of sowing the seed. This *Poa* is known, in Kentucky, by the name of "Blue grass." The English farmers call it "Smooth-stalked Meadow-grass." It is, confessedly, the most valuable of all the pasture grasses in Chester county, and probably throughout the Middle States.

In the small volume entitled "Agricultural Botany," now in press, by A. O. Moore & Co., New York, there are some fifty species of grasses (including the *Cercalia*) enumerated and briefly described. Of these, not more than twenty-five or thirty species are regarded as possessing agricultural value. The others are looked upon as little better than mere weeds; and a few of them are positive nuisances. Of those grasses which are considered as valuable in Chester county, Penn., either for hay or pasturage, the following may be named:

Alopecurus pratensis, L. But little known in Pennsylvania.
Phleum pratense, L. Very generally cultivated.
Agrostis vulgaris, With. Rather neglected, now-a-days.
Cynodon Dactylon, Pers. Scarcely known in Pennsylvania.
Dactylis glomerata, L. Real value not finally determined.
Poa annua, L. Too small to be of much importance.
Poa serotina, Ehrh. But little known in Pennsylvania.
Poa trivialis, L. Not particularly known by the farmers.
Poa pratensis, L. The most valuable of all the *Poas*.
Poa compressa, L. Highly nutritious, but the herbage scant.
Festuca elatior, L. A valuable grass, extensively naturalized.
Lolium perenne, L. In rich soil affords a good pasture.
Arrhenatherum avenaceum, Beauv. Real value not determined.
Anthoxanthum odoratum, L.* Not much esteemed in Pennsylvania.
Sorghum vulgare, Pers. var. *bicolor*. Under trial, for syrup and sugar.

Among the gramineous nuisances, may be mentioned the following:

Bromus secalinus, L. *Triticum repens*, L. All the *Paspalums* and *Panicums*; *Setaria glauca*, B., and *Setaria viridis*, Beauv., *Cenchrus tribuloides*, L., *Andropogon*, all the species.

With these desultory and imperfect notes, the other topics are committed to younger and more competent hands. Much careful observation is requisite in order to arrive at satisfactory conclusions.

W. D.

WEST CHESTER, PA., March 3, 1859.

* Some writers assert, that spring butter owes its fine rich flavor to the *Anthoxanthum*, or Sweet-scented Vernal grass. The fact does not appear to be well ascertained; but the experiment might be readily tried by feeding the cows, for a time, exclusively on the *Anthoxanthum*. It is by no means certain that cows prefer that grass. So far as the writer has observed, he thinks cows pass it by, to get at other early grasses. It would be interesting to know the facts of the case.

DISEASE OF THE GRAPE VINE AND THE REMEDY.

DISCOVERY BY P. LAZARIS, ATHENS, GREECE.

Any substance, dried and pulverized, which does not injure the foliage nor fruit of the vine, cures the disease of "*oidium*," with which it is affected.

It is because of the same qualities, that pulverized sulphur produces the same effect, and not as a specific as is generally believed.

Those who have thus far applied themselves to research, to discover a remedy for the disease called "*oidium*," have wished to find a specific, which would as surely cause it to disappear as does quinine break the intermittent fever. Consequently they have considered that sulphur possessed such specific properties, but no one discovered that any material reduced to very fine powder, and which would not injure the plant or its fruit, would equally well cure the disease.

When it is spread abundantly on the grape, where it attaches itself easily, it acts, as I believe, by its drying the parasitic fungus, absorbing its juices, and thus cutting off its nourishment. In some microscopic observations I have made, I think I have seen this effect produced just at the point where the peduncle of the parasitic grains are attached to the grape, and possibly, on the grains themselves.

Having observed that those grapes which lay upon the earth were not attacked by the disease, I concluded very naturally that the most efficacious means to cure it was by powdering the plant with earth.

The experiments which I made afterwards convinced me that the common soil of the fields, separated from gravel and sand, and very finely pulverized and dried a few hours in the sun, radically cured the disease. As a clay soil produced these effects, I concluded that all others would.

Having applied this important discovery in 1856, I addressed a report of it to Mr. Lambiki, at that time Deputy Prefect of Corinth. The year 1857 still further assured me the result I desired, and I consulted Mr. Choidas, a lawyer at Patras, as to the best manner for me to enter into an arrangement with the proprietors of vineyards, and to communicate to them my discovery. After consulting with Mr. Rouphos, mayor of the city, and with several other persons, he answered me that he thought the proprietors would voluntarily accord me a recompense, but that contracts should previously be entered into with them.

Considering this difficult to be realized, I consulted other friends. In 1858 I went from Corinth to Athens, and, by advice, I laid the affair before

Mr. Coumoundouros, Minister of Finance. He heard me with interest and told me that it came more properly under the department of the Minister of the Interior, but that his colleague would not be able to decide before the new session of the chamber.

I returned to Corinth for the vintage, and did not again return to Athens until towards the month of November. At that time I consulted Mr. Renieris, lawyer and Professor of Jurisprudence, as to the manner in which I should bring my proposition before the Government. I also spoke at length with Mr. Spiliotaki, Superior in the department of the Ministry of the Interior, and afterwards with the minister himself, Mr. Propelegious, who in turn referred me to Mr. Dossius, General Secretary of his ministry. Afterwards I sent a report to his Majesty, the King, who in turn wished me to address the Minister of the Interior, who invited me to present myself before a special committee.

Our first interview produced no results.

On the one side, I observed that such a discovery announced by a man not occupied in science, did not inspire much confidence, and caused different opinions, and on the other side, the time was approaching when this remedy should be applied, and the proprietors should enjoy its benefits.

Seeing that I could not attain the desired end in this way, and wishing to save the proprietors of Greece and other countries from the enormous expense of sulphur, I have decided to voluntarily publish my discovery.

The following experiments led me to consider my discovery as an infallible remedy. I powdered my vines with European sulphur, save one corner of my vineyard apart from the rest, which was saved for experiment. This was divided into two portions, one was treated with the sulphurous earth of Kalamaki, called "antirusty," (antigaleuse) the other simply with clay, leaving, at the same time, a few vines in their natural state, to see if the disease might not cease spontaneously. In due time, the three portions, treated with European sulphur, earth of Kalamaki, and with clay, alike showed the cure desired, while the vines not treated at all were entirely destroyed by the disease. Therefore I concluded that pulverized earth merited equal confidence with sulphur. As some persons suppose that sulphur exercises an influence at some considerable distance, I repeated the experiment the following year in a part of my vineyard distant from where sulphur was used, and not forgetting to leave some vines without any treatment. Three months later, the vines not powdered were destroyed, while those treated with argillaceous earth were saved, convincing me fully that such argillaceous earth radically cured the disease. Yet I resolved to continue the experiments during 1858, and test the following matters:

1st. If, in order to save expense and labor, two powderings would not suffice instead of three?

2d. What is the best time to make the applications?

3d. If, having omitted the first application, it would be possible to effect it by a later application.

In order to settle these three questions, I performed the following experiments :

I powdered a number of vines before flowering, and twice later, at the times when sulphur is usually applied. The cure was complete.

Fifteen days after I commenced the preceding experiments, I commenced another series in the same way. Nine days had not passed before signs of the disease appeared, when I immediately repeated the application of pulverized earth, and had the satisfaction to see the disease arrested. I repeated the experiment the third and fourth time with the same results.

Another series was powdered at the time of the setting or formation of the young grapes, but without success, although the earth was used abundantly.

A fourth lot was left untouched in the midst of the rest, which was like the last attacked.

From these experiments I have drawn the following conclusions :

1. The earth should be freed from sand and gravel, dried in the sun a few hours, pulverized very finely, and then sifted or bolted like sulphur.

2d. That as common clay is easily prepared as above, and adheres well to the vines, it is preferable to other kinds of soil.

3d. That the instruments generally used to apply the sulphur, will serve for this also, at least for the first and second operation, but the third time, as the grapes have then some size, it is desirable to have them more abundantly powdered, yet it is possible here too to use the same instrument used for sulphur.

4th. The powdering succeeds best when applied after sunrise, but while the grapes are still somewhat moist with dew. The following times are the best for the application :

a. When the young shoots have scarcely attained the length of a span, before the grape is in flower.

b. As soon as the flower has fallen and the young grape entirely set.

c. When these are of the same size as is thought sufficient in sulphuration.

5. Independently of these, even when performed with care, it is necessary sometimes to make extra applications, as, for example, each time after a heavy rain, after waiting a day.

6th. The removal of a part of the leaves, as is usual, is advisable, if practiced with moderation, otherwise, the vines deprived of leaves, the grapes may be scorched by the heat of the sun.

7th. If from any cause the first regular powdering has been omitted or neglected, it will be necessary to supply it by two others, with an interval between of eight or ten days. But it is indispensably necessary that it be done before the time of the second regular application.

8th. It is necessary always to perform the operation with the greatest care. It is well to have the workmen followed by another, who again carefully examines the vines and powders any that may have escaped. If after the use of the pulverized earth, any signs of the disease again appear, it

is proof that the operation has not been well done, and it is necessary to immediately repeat it with all the care that is bestowed when sulphur is used.

I have also used other substances besides earth, which, when not injurious to the vine, will cure the disease with the same success.

Such is my discovery, which long experience and the most satisfactory results have proved infallible. If any one is found who doubts it, only let him try it, apply the remedy according to the rules given, beginning before the shoots are the length of a span, and then if we will have the best results, apply at the times when sulphur is now applied. In this way may the expense of the sulphur be saved, and I repeat, the results are equally successful. I, myself, will use only clay the present year on my vineyard at Corinth.

Those who wish more explicit information are requested to address me directly.

[Signed.]

P. LAZARIS.

ATHENS (GREECE), *March 15th* 1859.

[Translated from the original by Wm. H. Brewer.]

LETTER FROM HON. JOSEPH A. WRIGHT, U. S. MINISTER AT BERLIN.

The annexed letter, addressed to Mr. Howland, of Indianapolis, and a duplicate forwarded to us, and we take great pleasure in presenting it to our readers :

Advantages of Foreign Travel—The Old and New Worlds contrasted—Statistical Reports of the Physical Resources of Germany, compared with America—Agricultural Advancement in Germany and France—The Artificial Production of Fish, and Transplanting of Trees—A few words of general admonition to American Farmers.

BERLIN, Wednesday, *October 12, 1859.*

MY DEAR FRIEND—One of the chief advantages of foreign travel and residence, if I may trust my own experience, is the accurate knowledge obtained by personal observation, of the true relation of one's native country to the rest of the world. Especially is it true of America, that only by contrasting her with Europe, can we arrive at any just estimate of what she now is, and of what she is destined to become. It must not be supposed that such a contrast, however flattering in the main, and comforting to the hearts of all true patriots, is entirely without its dark side. While it is too evident to admit the possibility of denial that America is in many respects far in advance of the Old World, it is also undeniable, that, in many respects, she is in the rear of her competitors on this side of the water. There is nothing humiliating in this fact, nor unpatriotic in the confession of it, nor is there anything discouraging in it. In a young nation like ourselves, composed of many heterogeneous elements, which are undergoing the process of being mixed up and shaken down into one homogeneous mass, there must necessarily be much that is crude, much to be changed for the better. It may do for those who, "while decrying the Old World," with indiscriminate rancor, as if it presented nothing good and worthy for our imitation, to hold up our own country as a perfect model for the universe to follow; but the true patriot and enlightened statesman is ever ready to acknowledge the shortcomings of his native land, for the sufficient reason, that it is only by acknowledging and facing them that they can be remedied.

If, while conscious of its general greatness, I take the liberty of speaking plainly of certain matters in which, according to my judgment, the Old World seems to be in advance of the New, our countrymen will have no cause to feel jealous of such criticisms. No other nation in the world can boast of more rapid progress in the right direction, than the last ten

years have witnessed in America. In no country of the Old World, for example, could a work so extended and expensive as that of Prof. Agassiz on Natural History, have been published by private subscription. It would have required a large amount of royal patronage; and I venture to assert, that it would not have found its way into half a dozen private libraries in Europe. The fact that our merchants, our men of business, who are regarded, even by intelligent Europeans, as a set of beings who never think, except to the chink of the "almighty dollar," subscribed by hundreds to this work, is a significant indication of the general character of our people.

We are moving, I honestly and hopefully believe, in the right direction, and we may accelerate our progress in no small degree, if, laying aside all prejudice, we open our eyes to what is commendable and worthy of imitation in the Old World. There are many things to admire—many to condemn. Our policy is to select the good everywhere, and to speak of the virtues of those with whom we live, and not their faults. If we hold up the virtues of our neighbors and not their faults, we shall make ourselves and neighbors better men. Of course, I disclaim at the outset, any right or intention to instruct the people of our State. My position in this country, and still more, my acquaintance with its men of science, afford me excellent opportunities for obtaining correct and invaluable information in respect to the improvement of the physical resources of Germany, and having the prosperity of my native State at heart, I feel it to be not only a sacred duty, but a pleasure to do what little lies in my power towards spreading that information among my fellow citizens. At the same time I must say, in justice to myself, that my leisure is somewhat limited, and the most that I can do, is to scratch off a few hasty and familiar lines now and then, to my most intimate friends, who, I know, will excuse the incoherence of a letter, written at intervals, and dispatched without the benefit of revision.

I have been much interested lately by the official statistical report of the physical resources of Germany, prepared with great labor and regardlessness of expense, perfectly accurate, and containing information valuable, not only to the manufacturer and the merchant, but to the farming population of the country. The thought has occurred to me, what have we similar to this in America? Nothing! I believe, as a general rule, we have less accurate statistical information in regard to the resources of our country and of Europe, than any other people in the world. In more than half the States of the Union there is no bureau of statistics; and the population is dependent upon the vague rumors, and too utterly unreliable reports of the press for information upon the state of crops at home and abroad. A single consideration will suffice to show the incalculable disadvantage of letting things go at such loose ends. An European correspondent, writing perhaps upon imperfect information or hasty observation, predicts a short crop and a scarcity of breadstuffs abroad. The rumor spreads like wild-fire through America, and the natural inference is, that Europe will have to look to our markets to make up her own deficiency. What is

the consequence? The experience of the last few years compels us to return a sad answer—a mania in speculation, a sudden rise of prices to a fictitious value—and then a sudden revulsion and panic, and commercial distress. To crown all, the foreign speculator, well informed of the state of things at home, and who has patiently bided his time, steps in at the favorable moment, when prices are at the lowest, and realizes an immense profit at the expense of our own farmers and merchants. One of our leading newspapers estimates our wheat crop for the year 1859, at three hundred millions of bushels, another at two hundred, and I see in the month of September, 1859, that it is announced most publicly, that the cotton crop of 1858, was three million eight hundred thousand bales; this, however, is disputed. We shall know the truth some of these days, after speculators and sharpers have done their work. I believe in Indiana there is a law requiring certain gentlemen who provide the community with paper, called money, to publish annually a statement of their issues, discounts, cash on hand, &c. But the labor of the country, its resources and productions each year are matters too small for such inquiries. If I am not mistaken, the article of wheat at Milwaukee, during the past year, in the space of ninety days, fluctuated from 60c. to \$1.60 per bushel.

So in case of a European war. We are accustomed to think that the withdrawal of a million of men from the labors of husbandry, must materially affect the cultivation of the crops; but the truth is, their places are supplied by the women of the country, who perform all the duties of agriculture, and, consequently, even a general war, unless protracted through a series of years, could not affect the resources of Europe so disastrously as to compel her to look entirely to America for supplies.

Now, what we want in every one of our States is a bureau of statistics, for the purpose of supplying our people with timely and accurate information of the state of crops at home. The reports should also embrace geological, mineralogical and other physical information of importance to our farmers and manufacturers. In addition, we should have a general statistical department, the business of which should be to collect and spread through the country, through official and reliable channels, correct accounts of the state of crops in Europe; and it might also be found desirable to charge this department with the duty of reporting, from time to time, the various improvements in manufactures, in mining, in scientific agriculture introduced into the European systems. I need not spend time in proving the advantages that would accrue from such an arrangement, as they must be evident to every one who will bestow a moment's thought upon the subject.

I have no doubt that I shall be told that all such matters should be left to the private enterprise of our people, and that the interference of the government would not only be uncalled for, but impolitic and unwise, because it would be departing from the ordinary range of objects for which our governments exist. Our State governments are too much mere *political* machines, devoted to the business of turning out laws and other legis-

lative enactments in almost incredible numbers and confusion, and to the manufacture of electioneering capital. Whole sessions are often consumed in unworthy and worse than useless squabbling over a set of resolutions of no earthly importance or interest to the country, except as they serve to inflame partisan feeling, and keep the dangerous fire of party spirit from dying out. We are so accustomed to this abuse of legislative functions, that we have almost become reconciled to it, and have nearly forgotten what the true duties of a government consist in. The object of a Republican Government is the regulation of the public affairs of the country in accordance with the wishes of the people. What are the "public affairs" of the country? Not merely laws, certainly not political resolutions; for besides the political and social interests of our country, there are others of equal importance to the people at large, which demand and which should receive the profoundest attention of our legislators. The scientific investigation of our national resources, for example, is a matter affecting the very foundation of our national greatness and prosperity. Our very existence as a self-supporting, independent nation, depends in a great measure upon it. For without a thorough investigation those sources can never be developed; and without the development of them, we shall gradually sink into a mere dependency of Europe. Individual enterprise, even in America, being inadequate to this work, and as it is further, more a public than a private measure, it is evidently the duty of that *public machine*, which we style government, to take the matter up and carry it through.

In this respect we might, with great advantage, follow the example of the French and German governments. Both in Germany and France agricultural schools and colleges are established and supported by the governments, and extensive experiments are carried out, which would be entirely beyond the means of private men. The benefits to the nation are immense. Agriculture has received a great impetus, and the products of the soil have nearly doubled within less than half a century in consequence of the introduction of improved methods of tillage. Look at the statistics of the wheat crop in France. Fifty years ago, according to a recent official publication, there were only about four million six hundred thousand *hectares* (a *hectare* contains a little less than two and one-half acres) of land sown to wheat in France, and the average yield did not exceed eleven *hectolitres* (two and three-fourth bushels to the *hectolitre*) to the *hectare*. In 1858, the wheat crop amounted to one hundred millions of *hectolitres*, at an average yield of fifteen *hectolitres* to the *hectare*, an increase of nearly one-half in about forty years.

This is a significant fact for America. As the population of France has increased only about one-fifth within the last half century, and as she now produces wheat in nearly sufficient quantity for her own consumption, it is evident that if she goes on improving her system of agriculture at the present rate, she will soon be in a condition to export breadstuffs instead of buying them. From her African province of Algeria, she will be able to draw large supplies of grain; and the day may come when Europe will

cease to depend upon America, and look to France for its breadstuffs. I fear, indeed, that that day is not far distant; but I fear only because I am compelled to believe that it will find us unprepared for the commercial changes which such a reversion of circumstances must necessarily produce. We depend upon the profits of our harvests to pay for our importations from Europe. But what if Europe ceases to be a market for our grain and our cotton, while we are still dependent upon her for the greater part of our articles of luxury?

We must look this danger steadily in the face, and prepare in season to avert it. It is not enough that we keep pace with the agricultural improvements of the Old World; we must keep ahead of them. We must make greater use of steam than England does in the application of machinery to agriculture. At the recent meeting of the Royal Agricultural Society at Warwick, the steam plows, cultivators, harrows, &c., formed the most interesting part of the exhibition; and unless we hold our own with the mother country in this respect, we must not be unwilling to take the consequences of our negligence.

Of course you will not expect me, within the limits of a single letter, to indicate every case in which we might profitably copy the example of Europe. I will only hint at two, of especial interest to our Western farmers—the artificial raising of fish, and the transplanting of trees.

Fish have been artificially increased and preserved in China for centuries. A little more than a hundred years ago, the subject began to attract the attention of scientific men in Germany, where the practice has already reached a high state of culture. In England and France, attention has been but recently directed to this branch of industry, yet it is successfully cultivated in both countries, and promises to become of the utmost importance to the world.

I will not attempt a description of the different methods pursued in France and Germany, as you will find one, better written, and with details which I cannot go into, in more than one of our scientific journals. I should like to have some of our Western men who happen to be the owners of small lakes or ponds, make the experiments for themselves. The field for scientific investigation is large and important, and the results, if successful, cannot fail to be highly beneficial. If all our ponds, lakes, brooks and rivers, were stocked with the better kinds of fish, their increase secured by artificial means, and protected against extirpation by wise legislative provisions, we should have a cheaper and healthy article of food constantly at hand. It is only a short time since salmon was a luxury in Hanover, Germany, only to be enjoyed by the wealthy; now it is within the means of the peasant as well as of the noble. On the 22d of last February, I had a salmon from Hanover, on my table, which weighed 32 pounds.

I send you the enclosed paragraph from an English paper, as it not only serves to illustrate the practicability of the artificial propagation of fish,

but conveys a hint toward the stocking of our great inland seas, which should not be lost upon our countrymen :

“ At a recent sitting of the *Société d'Acclimatation*, Dr. Cloquet read an interesting paper on a successful experiment recently made by M. Coste, in a pond situated at St. Cucufa, one of the domains of the Emperor, near St. Cloud. It had hitherto been considered impossible to produce salmon in a state of domesticity, without their emigrating to the sea ; M. Coste's experiment proves the contrary. The small pond above alluded to, situated in a shady valley, does not cover a surface of more than two and a half acres. Its greatest depth is six metres, from which the bottom rises in a gentle slope to the grassy bank. It receives its waters by transudation from the high ground with which it is surrounded. Three years ago it was emptied for repairs, and when it afterwards again received its usual quantity of water, M. Coste stocked it with some trout, which are now four years old, and about a foot and a half in length. In April and May, 1857, he added several thousand liliputian salmon, bred at the College de France two months before, and, notwithstanding the havoc committed by their voracious enemies, the trout, they have thriven so well that some time ago, in the presence of their Majesties, upwards of two hundred kilogrammes' weight of these fish were brought up in a single draught of a net. They were on an average about a foot in length. But the most important circumstance which M. Coste remarked on this occasion, and which adds a new fact to science, was that all these fish were in a state of reproduction ; the spawn which they contained had come to maturity, and it has since been subjected to artificial fecundation ; the embryos resulting therefrom are so far developed that they must soon be hatched. Hence it is proved that salmon may be propagated in close waters ; and also, that salmon, like trout, begin to spawn at the age of eighteen months.”

My letter is already too long ; and yet I have not said a word about the transplanting of trees. It is a subject of vast importance to us. We have immense tracts of open prairie country which must be gradually covered with trees ; and as it is for our interest that it should be done as speedily and as durably as possible, it is necessary that our western farmers should thoroughly understand the art of transplanting. It seems to be perfectly understood in France. There they transplant trees ten, and even twenty years old, conveying them for miles, without cutting off anything but the *top roots*, and that too in the month of May, when the sap is up and the tree in full bloom. I confess that the first time I witnessed the operation I was astonished enough to remonstrate at the unseasonable time chosen for it ; but the answer was briefly this : “ We never lose a tree. Did you ever know a surgeon to remove the limb of a man in feeble health with success ? On the contrary, in order to preserve the man's life, he seeks to perform the operation when the patient is strong and full of vital energy.”

I repeat we must not allow the Old World to get ahead of America in the great agricultural and mechanical improvements of the age. But this is not all. We must not only be up with Europe, but as far as possible,

independent of Europe. As the Old World begins to cultivate the raw material for the supply of her manufactories, we must build up manufactories at home to be supplied by the products of our own fields. We must not only *raise*, but *manufacture*. In the words of Thomas Jefferson, a little varied, we must place the producer of the raw material, "the manufacturer and the consumer, side by side." Whenever we do this we shall be able to look on without alarm when the quarrels of despots, or the terrors of sanguinary revolutions, shake Europe from center to circumference.

And much, very much, depends upon the exertions of our farmers. I am not capable of giving you advice upon the technical management of your farm; but you will allow me to add a few words of general admonition. 1st. Take the best agricultural paper in the country. 2d. Teach your children by your own example. 3. When you have anything to sell, and can get a reasonable price for it, do not run the risk of getting less by waiting for the price to rise. 4th. Attend the public meetings and exhibitions near you, which tend to make labor more attractive, and take your wife, sons and daughters. 5th. "Plow deep, but drink shallow." Lay these words to heart: 6th. **KEEP OUT OF DEBT!** I would to God that, by constant repetition, I could impress this warning upon the mind of every farmer in America.

Some time ago, I forwarded to the Patent-office, at Washington, a very interesting document concerning the agricultural schools and colleges of Prussia, from the minister of agriculture. About the same time, an able letter, from Baron Speck, who resides near Leipzig. I had the pleasure of spending a day on his farm. You will be delighted with his views of farming. In this letter you will also find a full account of the Saxon Merino sheep. I doubt not, before this time you have seen both of these valuable communications in print.

Yours most faithfully and truly,

JOSEPH A. WRIGHT.

POWELL HOWLAND, Esq.,
Indianapolis, Indiana.

PERSIAN INSECT POWDER.

ST. PETERSBURG, Sept. 6, 1859.

TO COLONEL B. P. JOHNSON :

My Dear Sir—Your friendly letter of June 28th, arrived punctually, and I thank you greatly for the books which you have been so good as to deliver to Mr. Nottbeck, to be forwarded to me. I hope soon to receive them.

I chanced to procure a small portion of seeds from two *Pyrethrum*—which compose the Persian powder against insects—and I send them to you in the pipe of the quill enclosed within. The upper part, e. a. d., near to the cork or stopple, contains the seeds of the *P. carneum*; the lower part, e. a. d., near the point of the pipe, those of the *P. roseum*. I greatly desire that they may bloom with you, and these useful plants become acclimated in America.

In the meanwhile receive, Sir, the assurance of my highest consideration and sincere attachment.

VICTOR DE MOTSCHULSKY.

We have placed these seeds in the hands of a competent person for trial, and hope he may be successful in rearing the plants. From all the accounts we have had of the "Persian Powder," from our correspondents in Russia, there is no doubt of its being very useful; and, if it can be introduced here, may aid in some degree, at least, in diminishing the ravages of insects.

J.

FROM THE PRESIDENT OF THE REPUBLIC OF LIBERIA, AFRICA.

(Copy.)

Whereas, The Secretary of the New York State Agricultural Society has generously, through the agency of Hon. B. V. R. James, forwarded to this Association a number of valuable volumes, containing the "Transactions of the New York State Agricultural Society," and the "Transactions of the American Institute of the city of New York," and other works of a highly interesting character, on the cultivation of the soil, for the more general dissemination of knowledge and system among our farmers ; therefore,

Resolved, That we return our sincere thanks to the New York State Agricultural Society, for this generous manifestation of interest in the tilling of our soil, and especially for the donation of books on an improved agriculture.

Resolved, That we acknowledge, with feelings of the deepest gratitude, this munificence from our friends in New York, and appreciate their benevolent efforts to aid us in farming economy—renovation of the soil—a chemical analysis of its properties, and in the most useful and practical information of the day.

Resolved, That the general principles of farming, as laid down in these works, should be industriously circulated throughout the Republic, and no effort should be wanting, on the part of this Association, to interest all of our farmers with such scientific and systematic information as will commend itself to their judgment.

Resolved, That the President of this Association is respectfully requested to forward, through the corresponding secretary, a copy of the above resolutions to the secretary of the New York State Agricultural Society.

STEPHEN A. BENSON,

President of the N. A. A. R. L.

P. T. MORRIS CHESTER,

Secretary of the N. A. A. R. L.

THE SECOND NATIONAL FAIR.

Subjoined is the interesting report of the Committee of Adjudication of the second National Fair of Liberia. It is from the pen of Judge Augustus Washington, formerly of Hartford, Conn.

To His Excellency, S. A. BENSON,

President of the Republic of Liberia :

Sir—Your Committee of Judges, for the National Fair of this Republic, who were appointed by your Excellency, in accordance with an act of the Legislature of 1857–58, having concluded their business of adjudication, beg leave to submit to your notice the following report:—

The second National Fair of this Republic was opened on the 21st of December, 1858, and continued its exhibitions from day to day under the judicious directions of the Committee of Arrangements, to the 28th of said month.

A large and appropriate building of a temporary character, was erected in the Government Square, for the express purpose of receiving the numerous contributions of agricultural, horticultural, mechanical and scientific industry. This spacious building being covered with palm thatch, which is the native mode of covering houses on the greater part of this coast, has sometimes been called the "Palm Palace." It fully answered the purpose which the committee designed, and was fully ample to accommodate the numerous crowds of visitors who usually throng our metropolis at this season of the year. The committee, as well as the large assemblage of citizens who were present at the opening of the fair, were highly gratified with the just and very appropriate remarks your Excellency was pleased to make, in introducing to the audience the Hon. A. F. Russell, whose happy strain of instructive and eloquent thought entranced the assemblage on that occasion. This pleasing exercise gave a happy prelude to the many intellectual banquets which the gentlemen of the Committee of Arrangements, with such good taste and judgment, continued every evening during the exhibition. Your committee highly approve, and are very grateful to the committee of arrangements for their active vigilance in securing such good order and arrangement, in the disposition of the various articles on exhibition, and such peace and concord among the numerous spectators. They were also gratified that the committee were not satisfied with merely arousing and indulging our curiosity with the surprising works of Liberian art and industry, but that the most fastidious might be gratified, added to the charms of eloquence the stirring strains of music;—thus combining instruction with utility, mirth with harmony and good order, and rendering the exhibition an occasion for the interchange of sentiment, and the mutual congratulations of our citizens from every section of our Republic.

The extraordinary continuance of the rainy season, nearly up to the time of the Fair, has prevented the early maturity of the crops, and hindered many of the exhibitors of last year from being ready at this time. Yet there has been a decided increase of interest in the present exhibition, and a growing and firm conviction in the minds of the people, of the great importance and usefulness of such annual gatherings.

And we are happy to state that our highest gratification arises from the cheering facts, that while we have, with trembling solicitude, endeavored to discharge the duties of our office with honor, justice, equity and disinterested good will, we are continually receiving evidences that our citizens have been highly delighted with the happy means which the Legislature,

your Excellency, and the Government, have so wisely adopted to develop the commercial, agricultural and mineral resources of the country, and the mechanical, scientific and intellectual capacities of the people. Great praise is due to the exhibitors, that they have all been satisfied with their awards, whether small or large; thus evincing their honest purpose not to vie with each other for considerations of present gain, but to provoke each other to more active industry and better works, and to develop the wealth and natural resources of our common country, with a patriotic zeal and devotion only to promote her best interest and highest happiness. Probably on no other occasion in the history of our race has there been such abundant evidences at one time of the capacity of our people for self-support, self-government, and true independence. Not only animal and vegetable food and raiment, but many of the luxuries of civilized life, are now produced in profusion from our own soil. Truly a new era has dawned upon our nation, and the finger of Providence points us to a higher, happier and brighter destiny.

Cotton, sugar, coffee, which give fair promise of soon becoming the principal staple products of our country, were some of the articles that claimed our special attention. Knowing that our farmers had engaged more largely in the cultivation of these than at any former period, we naturally expected to see them largely represented. Although the demands of the act were fully answered, the lateness of the dry season prevented the maturity of the crops, and the severer competition which otherwise would have followed. There were more than a dozen specimens of cotton, but only one that in weight reached the amount required by the law. Those lots which were less than fifty pounds were the best ginned and cleaned, exhibiting several qualities, some of a coarser and a finer texture, some a long and silky staple. We regret that our limited knowledge of testing these qualities would not enable us to recommend, with certainty, only the best marketable specimens.

The articles next in importance exhibited, were several fine specimens of sugar, from the banks of the St. Paul's. Our farmers, in this article, already emulously vie with each other in producing fine qualities. The success of sugar-growing has ceased to be a question. It only remains for our planters to obtain small and convenient mills, and adopt some system of cheap manual labor, to enable them to produce an unlimited quantity of good sugar.

It has been supposed that in this climate sugar would not keep; but some of our farmers, to test the matter, exhibited fine specimens that were manufactured from the crops of last year. The two steam sugar mills on the St. Paul's river, if the toll be not too high, have at least ten times the amount of labor that they did the last year. And we have every reason to believe that the crops of Montserrat county, if no sugar or syrup should be exported, would yield enough to supply all the demands of home consumption; while at the lowest estimation of progress, the same demand may be met the next year, and fifty per cent exported.

Our superior Liberian coffee was also well represented by specimens

from the agricultural committee. This produce seems to flourish equally well in all the counties. But the largest crops, at present, are produced in Grand Bassa county. Many of our citizens in Montserrado county have thousands of coffee trees, but they have not yet attained that age and maturity which those have in the Leeward counties; nor are we yet certain that our clay and loamy soil on the banks of the river is so well adapted to the growth and yield of coffee as the sandy soil of Bassa and Sinou. But the representations that your committee have seen, show that there is a very large yearly increase of this product, and that the probability is strong that in a very few years we may hope to supply our home demand and to export largely to other countries.

There were exhibited also some specimens of tobacco, of a very good quality, raised and cured at Carysburg and on the St. Paul's river; besides this, we have seen other specimens cured in Liberia that could not be distinguished from some of the best we import from America. As tobacco is one of the kings of Africa, it has been a question with many whether it would be a wise and sound policy for the government to encourage its growth. Those who profess to be judges say that the segars exhibited, manufactured from the Liberian tobacco, were a very good article.

The yield of rice and cassava the past year appears to have been most abundant; every farmer seems to have a large supply for his own use and a surplus for sale. If only half of such crops should be planted from year to year, such a scarcity of bread stuffs as we had the year before last could hardly ever again occur.

Arrowroot, ginger, cocoa, eddoes, yams, beans, peas, corn and corn-meal, sweet potatoes, and many other vegetables, were well represented, while there were representations at the fair and from the agricultural committees, of a large profusion of the plantain, bananas, oranges, plums, cocoa-nuts, and various fruits of less importance.

There were several specimens of chocolate, richer than of any foreign manufacture, but not having that fineness of preparation for which the latter is remarkable.

Colonel Yates exhibited some of the material and some of the rope of his own manufacture, from a leaf called by the Kroomen *caffier*. This leaf is from a plant growing on our beach, the root of which is used for bait by the fishermen, and the fiber of the leaf is very long, strong, and of a flax appearance. It must necessarily become an important article of domestic use, and, if very abundant, one of commerce.

Last year a few yards of cloth, woven from African cotton by a Liberian lady, were exhibited at the fair. This year several pieces of cotton cloth, twenty yards each in length and of the same material, were exhibited, woven by different ladies, and also pieces of carpet. Besides this, pantaloons, coats and vests, were exhibited, which were the product of persons who grew the cotton, cleaned it, made the cloth and the clothes. The looms on which the cloth was woven were made by our own Liberian mechanics.

It is very pleasing to know, that in the event of any difficulty that might occur to prevent, for a time, the intercourse of foreign nations, we might then fall back on our own manufacturing resources.

In the mechanical department there was a very large wardrobe made of different kinds of fine and beautiful grained wood of our Liberian forest, executed in a style and finish equal to some of our best imported furniture. There were also bedsteads, chairs, and other articles of furniture, as well as many specimens of machinery for different purposes, which from their apparent utility gave much credit to their inventors. These were evidences that there was among the people a mechanical inventive genius, which needs only the encouraging and fostering hand of patronage to enable it to produce the most astonishing results. There can be scarcely a doubt that there are mechanics amongst us not inferior in their line to the best in America.

The contributions of the ladies, with reference to domestic economy, formed a department in itself equally interesting. There were vests, collars, capes, caps, bonnets, quilts, skirts, and various minor articles of the toilet and paraphernalia of the ladies, skillfully embroidered, tastefully and elegantly wrought, evincing not only their ability and skill, but their patriotic and common interest in whatever pertains to the prosperity of the sterner sex, and the success and good fortune of our common country. Our hard-working mechanics and farmers have reason to thank the government that it has induced the ladies to discover their latent powers and capacity, by which they will be able to produce by their own industry, in future, many costly articles which they formerly demanded from abroad.

The ladies also produced several kinds of preserves, of fruits from our own gardens and forests, and some good articles of wines, cordials, candies and pickles.

The exhibition of cattle, swine, sheep, goats and fowls, was not what it would have been if the committee had thought in time to appoint a special day for that purpose. The want of this arrangement prevented many persons, who had prepared to exhibit, from getting their animals to the fair.

Mr. Roe exhibited some of the finest specimens of pressed bricks that have ever been made in this country; others exhibiting good qualities of common brick.

There were some specimens of iron ore, weighing one hundred and fifty pounds, supposed to be the best ever found in this vicinity.

There were other mineral specimens, about which, the committee, for want of a better knowledge of mineralogy and chemical philosophy, have not dared to venture an opinion.

Rev. J. S. Payne read part of a treatise on Political Economy before your committee. It was an article of intrinsic literary merit, ably written, and containing much valuable information, which we hope he will soon give to the public.

It may be proper to state here, that for reasons unknown to us, there was no report received from the agricultural committee of Maryland county.

The reports from the committees from Sinou and Grand Bassa are stated in order under the list of premiums which accompanies this report. We also beg leave to refer your Excellency to the list of premiums for the enumeration of the several awards, made according to our judgment, in accordance with the act, as well as those left to our discretion. The entire number of articles exhibited was , on most of which, premiums of a greater or less amount were awarded.

We could not feel that we had discharged our whole duty, if we failed to acknowledge our firm conviction that the national fair has created a new epoch in the history of agricultural, scientific and mechanical industry in Liberia; that it has aroused the slumbering energies of the people, and inspired them with new motives and impulses to generous action; that it has settled many disputed questions in regard to the fertility of the soil and the capacities of the people; that it has, in fine, accomplished the great purposes which the Legislature, your Excellency, and the officers associated with you, aimed to effect.

The committee are of opinion that the only objection to raising live stock in greater numbers, consists in the difficulty of obtaining durable and cheap fences in this country, and that some cheap system of fencing is indispensable to the success of every farmer.

In conclusion, your committee beg leave to submit to your Excellency the following recommendations:

1st. That should there be at any time any enactment amendatory to the present act, that it be made to encourage the growing of palm hedges as fences, which thus far have proved to be the best. Let the first quality be a lot of ten acres of close hedge, free from breaches, capable of turning any kind of live stock; also ten acres of younger growth, with gradations in quality as in other cases.

2d. That the fair, in future, shall be opened on Tuesday instead of Monday.

3d. That premiums be awarded on nothing exhibited at the fair which shall be presented after the second day, except cattle, &c.

4th. That the agricultural committees be selected from the most intelligent and practical farmers that the community can afford.

5th. That the committee of arrangements give notice before the opening of the fair of some special day for the exhibition of live stock, poultry, &c.

6th. That the government continue to supply the people with the best qualities of cotton seed.

All of which is most respectfully submitted.

A. P. DAVIS,

Chairman Com. Adjudication.

UPPER CANADA BOARD OF AGRICULTURE.

Report of the New York State Fair of 1859.—Submitted at the meeting of the Board of Agriculture, February 23d, 1860

TORONTO, February 20th, 1860.

The undersigned, visitors to the exhibition of the New York State Agricultural Society, held at Albany last autumn, beg leave to submit the following notes of their observations on that occasion :

ALBANY, N. Y., October 5th, 1860.

This, the nineteenth annual exhibition of the New York State Agricultural Society, is perhaps the most successful which the Society has ever held. Taking place at the capital of the State, the beautiful old city of Albany, where there is a large local population, with plenty of hotel accommodation, abundant traveling facilities in every direction, the city of New York itself at no very great distance, and delightful weather for visiting, everything has been, so far, favorable to a successful meeting, and the result has fully borne out the expectations of those interested.

The show ground lies to the eastward, about two miles from the center of the city. The entrances to the grounds face the south-east, the business offices being placed along the front. Inside, on the right, is the Floral Hall, devoted to the display of fruit and flowers and the fine arts. It is about 170 feet in length, running north-east and south-west. To the north-west of this, running parallel to it, and at suitable distances from each other, are the Domestic Hall, the President's office, a refreshment shed, and six long covered sheds for sheep and pigs. To the right, or north-east of all these, is the horse ring, about three-eighths of a mile in circumference, enclosed by a slight board fence, with seats erected for the spectators to witness the action of the horses, trotting around the ring—this being one of the chief attractions. Going back to the entrance, and looking to the back of the ground, running in the same direction as the buildings already described, and parallel with each other, we have on the left two Mechanics' Halls, for the display of machinery and manufactures of various kinds, each nearly or about 200 feet in length and 50 in breadth, the dairy hall, a shed for carriages, and the vegetable hall for the exhibition of grain, roots, &c. Further to the left is the poultry shed. North-west of these buildings, and running north-east, are seven long sheds for cattle, parallel with each other, each about 200 feet in length, and each capable of accommodating about forty head of cattle. In addition to all this accommodation for stock, all around three sides of the enclosure there are stalls or

boxes for horses and bulls, to the number of some three hundred, or thereabouts. The implements are displayed between the mechanics' halls and the front and south-east side of the grounds. All the buildings described are slight temporary erections, of mere rough boards and scantling, which will, no doubt, answer very well with such fine weather as we have at present, but which, in case of a wet and tempestuous time, would expose the property exhibited to great damage. We have long come to the conclusion in Canada, that such buildings are not good enough, or safe enough for our Provincial Exhibitions, where property is exposed to all the risks of the weather for several days. The general plan of the grounds and buildings here, however, is excellent, affording plenty of room and convenient divisions for the proper arrangement and classification of animals and articles on exhibition. The ground itself is beautiful situated, and is in excellent condition for the purpose. It rises with a gentle ascent from the front or south-east towards the back, or north-east; the view in the background being terminated by a range of hills, crowned here and there with trees. Looking in the other direction, the view beyond the front of the grounds, across the river, is charming, consisting of undulating fields, hills and slopes, adorned by groves and clumps of wood, now brilliant with all the gorgeous and changing tints of autumn.

The exhibition is extensive and excellent. The following is an abstract of the entries: Cattle, 362; horses and mules, 517; sheep, swine and poultry, 603; agricultural implements and machinery, 495; grain, seeds, vegetables, sugar and honey, 360; domestic manufactures, 364; miscellaneous, 601; fruits and flowers, 253. Amounting in all to 3,555.

It is estimated that there were about forty thousand people on the ground to-day. The total receipts were over \$5,000. The total receipts up to this (Wednesday) evening, are \$7,800. They will probably be greater to-morrow. The Hon. David Christie, of Brantford, is here, and there are some other Canadians, besides the undersigned. Mr. Snell, of Chinguacousy, and Mr. Jeffry, of Vaughan, are here as exhibitors. Mr. Snell has sold a Liecester ram for \$300.

THURSDAY, *October 6, 1850.*

We now propose to give a brief general notice of the several departments of this great "Fair," as this and similar exhibitions are somewhat incorrectly termed.

In the class of horses there was a very large display, the entries as we have already stated, being over 500, and the several committees of judges have been occupied nearly the whole of yesterday and to-day in examining the merits of the animals in the various subdivisions. The ring in which they show their paces, some three-eighths of a mile in circuit, is constantly surrounded by a close packed hedge of interested spectators, from three to ten in depth. We do not admire the system of showing horses at an agricultural exhibition in trotting sulkies and buggies, but here it is carried so far as to be almost universal, even with stallions, breeding mares and

two year olds, and appears to suit the taste of the people better than any other mode. As to the quality of the horses exhibited, one does not see here the large, showy, slow-going draught and coach horses, which predominate at our own exhibitions. The moderate size, active, compactly built and spirited Morgans and Black Hawks appear to be the favorites, and are here in great force. Some of the stallions of these breeds are of beautiful symmetry and action, and are held at high prices. A greater sprinkling than we have of these breeds of horses would be very useful in Canada. Amongst the "horses of all work," we noticed "Toronto Chief," bred in Canada, and sold by Mr. R. A. Goodenough, of Toronto, last spring, for \$6,000, and now the property of Mr. L. R. Bowne, of Flushing. The Chief was looking in good condition, and was the center of an admiring crowd. It would be impossible for us to specify particular animals. Although there are a great many very fine specimens, there are on the other hand, a great many others very inferior.

In cattle, the exhibition is beyond all praise, and quite exceeds in the beauty and value of the animals any exhibition that we have yet had in Canada. In this remark we refer more particularly to Durhams and Devons, for in Ayrshires we are of opinion that our Kingston Exhibition was better than this, and of Galloways they here have none. There are a few fine Herefords, of which breed we have in Canada no good specimens, and a few Alderneys, of which we have none. Samuel Thorne, of Thornedale, Washington Hollow, Dutchess County, N. Y., who is the largest exhibitor of Durhams on the ground, is believed by those well informed upon the subject, to be the possessor of one of the largest and best herds of high bred Durhams in the world. He is a young man, with ample means, and he has entered into the business of importing and breeding cattle, sheep and swine on the most extensive scale, boldly picking up the choice lots at the great sales in England, and carrying them off over the bids of some of the wealthiest English breeders, anxious to secure them. Amongst the bulls which he exhibits here, are "Grand Turk" (12969) which takes the first prize as an imported bull over three years old; "Second Duke of Thornedale," 1st prize as a yearling, and stated by many experienced judges here to be the finest animal they have ever seen; and "Fourth Duke of Thornedale," under one year old. Amongst the cows and heifers are "Lalla Rookh," of European celebrity as a prize taker at English exhibitions, and who has also carried away the palm at every competition on this continent; her cost in England was \$3,000; she is a perfect model of a Durham cow, and takes the 1st prize here as an imported cow. "Mistress Gwyn," 1st prize as a cow three years old and upwards, bred in the country; "Fornarina," 2d prize do; "Favorite," 1st prize, two years old; "Gertrude," 2d do; "Lady of Oxford" and "Princes of Oxford," 1st and 2d prizes as yearlings. We cannot describe the merits of these animals in the technical language used by breeders, but they are superb, and should be seen to be appreciated. There are many other good animals on the ground in the hand of other breeders, as will be shown by the prize list, but we have

not time to particularize. Amongst the exhibitors of foreign cattle, that is, cattle owned out of the State, is Mr. W. R. Duncan, of Kentucky, who has fifteen or twenty Durhams. They are good serviceable cattle, but somewhat old in style, and not equal in beauty to those from the herds of the chief New York breeders. In the class of Devons, Mr. C. S. Wainwright of the "Meadows," near Rhinebeck, Dutchess county, is, we believe, the largest exhibitor, and we believe he is also the possessor of the largest herd of this breed of cattle in the State. Nearly all of the animals he exhibits have all the points of the Devon perfection. His bull "Omer Pasha," which obtains the first prize here as an imported bull, was awarded the first prize as a yearling at the show of the Royal Agricultural Society of England, at Carlisle, in 1855. Still, Mr. Wainwright, although he takes the largest number of prizes in Devons, has been obliged to yield the first prize, whether rightly or not we cannot say, to other competitors, in some of the subdivisions of the class. While speaking of Devons, we will observe that scarcely anything can be more beautiful, in the way of an exhibition of cattle, than the large number of yokes of Devon oxen on exhibition here. They are all so much alike in their general appearance, color and symmetry, and their long tapering graceful horns, that when a number of them are displayed together, as they are here, the effect is very striking and agreeable.

In sheep, the exhibition is also large, there being over 600 entries of sheep, swine and poultry. The largest number of sheep on exhibition are Merinos and Saxons, which, although they have an indisputably fine fleece, have no great attraction for the Canadian breeder. There are a good many South Downs on exhibition. Mr. Thorne has a very fine lot. They are bred from recent importations, either from the flock of Jonas Webb, Babraham, or from sheep that were prize winners at the show of the Royal Agricultural Society of England. The long-wool sheep exhibited by breeders in the State are not, generally speaking, very good. Mr. Snell, of Chingacousy, U. C., has the best lot on the ground, and he has sold several of them at very good prices.

The show of pigs is not very large, and nothing very noticeable in it, except some particularly beautiful Essex pigs, shown by Mr. Thorne.

In poultry, there is nothing deserving of very particular remark. We consider the display scarcely equal to that at some of our own Provincial exhibitions.

The attendance to-day has been immense. Every part of the twenty-acre enclosure, and of every building in it, has been crowded to such an excess, that it has been difficult to move about. The receipts to-day have been over \$7,000, making, we believe, \$16,000 to the present time, (Thursday evening.)

FRIDAY, *October 7th*, 1859.

The show of agricultural products here, is not extensive; we would scarcely see so meager a display at one of our county or township shows in

Canada. There are only two or three samples of wheat, and these of indifferent quality, two or three of oats &c. We notice three lots of Swede turnips, of which only one lot is more than of very ordinary quality; and three of Mangel-wurzel, in all of which there was only one really good root. Even in Indian corn, which we should expect to find very good, the display was not equal to that at some of our shows in Canada, the ears being small, and the grains on the same ear of different colors and varieties. In potatoes there was a very fair display. Again, in garden vegetables, there was only a very moderate show, the carrots, parsnips, beets and some other varieties were inferior, and would scarcely be shown at an exhibition in Canada; the onions, celery, cauliflower, cabbage, were very fair in quality. Amongst the articles attracting particular notice in the "Vegetable Hall" were some specimens of the Chinese potato, (*Dioscorea batatas*) the roots being forty inches in length, and weighing eight to twelve pounds each. The exhibitor, Jacob G. Sickles, of Stuyvesant, Columbia county, about eighteen miles from Albany, states that they have been grown from seed planted this year and under ordinary cultivation. He also states that the quality for the table is quite equal to that of the best varieties of the ordinary potato, and he believes that when the proper mode of cultivating the root is well understood, it can be planted with profit. Mr. S. V. Thornton, of Watervleit, exhibits the Feejee tomato, said to be a new variety of that vegetable, and superior to those previously in cultivation. It is very solid, and has been the favorite variety this year, where it has been introduced. Why the exhibition of the important products of the field and garden should be so poorly represented, we can only account for by supposing either that the country around Albany is not a very good agricultural district, which we believe is really the case, or else that the society does not attach much importance to a show of mere agricultural products as compared with cattle, machinery, &c., and consequently does not offer large enough premiums to induce the farmers to bring them out. At Syracuse last year, we are told, there was a large display in these classes of products.

In fruit, the show was large and good, particularly of pears and apples, of which the specimens were remarkably fine; of plums and peaches there were none, the season being too late for them; grapes were good, but not very remarkable. The fruit table was 120 feet in length, with three wide and well filled tiers on each side. The show of flowers was also large and fine, particularly of dahlias. The fine arts, exhibited in the same building as the fruits and flowers, were not very well represented.

In the Dairy Hall the large display of cheese should indicate that more attention is paid to this branch of farming than to some others. There were some fifty specimens, weighing some 100 lbs. or over, each, and, we judge, of excellent quality. Butter was not so well represented, there being only a dozen or two small lots.

In implements, there was a very large and excellent display. They were reapers and mowers, plows, straw-cutters, farm boilers, harrows, rollers, churns, cultivators, fanning mills, thrashing machines, portable

mills, cheese presses, clover mills, portable grist mills, seed drills, corn shellers, hay packers, &c., in great variety and profusion. The implements, we think, covered some three acres of ground. It would be impossible to specify more than a few articles. Amongst those deserving particular mention is Sherwood's grain binder, a little machine which may be attached to any reaping machine for binding the grain in sheaves before it is deposited on the ground. The exhibitor of the binder, states that he has bound 150 acres of grain with it this year; and that it is of perfectly practical application. Numerous testimonials from practical farmers certify to the value of the invention; but at all events, whether it is perfectly applicable in all cases or not, it has unquestionably solved the problem of binding grain by machinery, and shown how, with possibly some modifications under certain circumstances, the labor of at least five men per day can be saved. We consider this a most valuable improvement, and one which ought to be brought into general notice. It received a high premium at the United States exhibition, at Chicago, in September. The material used to bind with is a light wire, which is passed round the sheaf, cut off the proper length, and the ends twisted together so as to hold firmly. It binds as fast as the reaper can cut, and in a much neater manner, and with less waste than by the ordinary method. The price of the machine is, we believe, \$30. The manufacturer is Allen Sherwood, Auburn, State of New York. George Merritt, of Tecumseh, Michigan, exhibits a little machine for husking corn, which does its work neatly and expeditiously, and would effect a great saving of labor where much of that crop is grown. It is worked by hand, and only costs three and a half dollars.

In the two "Mechanics' Halls" may be seen every variety of machinery and manufacture, from steam engines and printing presses to the smallest articles. The exhibition in this department is much more extensive than we ever have in Canada, and would well repay an attentive examination, but we have no time to report upon particular articles.

In the "Domestic Hall" were exhibited all sorts of small manufactures, including pickles, sauces, groceries, specimens of bookbinding, ladies' work, harness, upholstery, cabinet work, saddlery, trunks, carpeting, turning in wood, &c., &c., in endless variety. We noticed in this department, a less number of the elegant and fancy articles contributed by the ladies, such as crochet work, embroidery, netting, needlework, &c., than we usually see at our own exhibitions.

To summarize the comparison between ourselves and our neighbors, we should say we must improve a good deal before we can equal them in our horses, Durham and Devon cattle, fine woolled sheep, implements, machinery, manufactures generally and dairy products, at least in cheese; while in our Ayrshire cattle, we are at least on a par with them; in long woolled sheep, pigs, grain and roots, the latter especially, we excel them. In implements, some particular sorts of ours are perhaps better than theirs; their plows, for instance, would not be fancied by many of our farmers,

and certainly do not do nearly so neat looking work as our own, but they excel us greatly in the variety and quantity of implements displayed.

In one respect our neighbors greatly excel us, and that is in the concourse of people who flock to the grounds. This is partly attributable to their greater population, and partly to their greater propensity for sight-seeing. On the greatest day, Thursday, with the grounds and buildings completely thronged in every part, by thousands upon thousand of restless spectators, machinery and implements of every sort in perpetual motion, horses showing their paces in the ring, the steam plow, or rather the motive engine without the plow, perambulating the ground in all directions, a dozen church bells on exhibition of from 3,000 lbs. weight and downwards, continually sending forth their clanging sounds, there was presented to the eye and ear, one of the most indescribable scenes of din, bustle, hubbub and confusion which can be well indulged.

To-day, Friday, we leave early, but we do not doubt that the attendance will be again large, and the receipts are certain to exceed \$20,000, which is several thousand more than on any former occasion.

A plowing match takes place to-day in a field adjoining the grounds, but being obliged, as we have above stated, to leave early, we could not spare the time to examine the work, we could easily see however, at a glance, that it was not of that clean, smooth character, which we see done in Canada, the style of plow used here not admitting of it, although, perhaps, it may be argued that the work they do is really as useful for practical purposes.

RICHARD L. DENISON,

Treasurer.

HUGH C. THOMPSON,

Secretary.

NEW GRANADA.

We give an interesting extract from the journal of Mr. Eugene Roehen, of France, a corresponding member of this Society, on a portion of New Granada, a country which is attracting much attention at the present time. It will be seen that the resources of the country explored by Mr. Roehen, if developed, would prove of great advantage to our commercial relations. Mr. Roehen's journal, of which we may hereafter avail ourselves as to other portions of South America, is very interesting, and will show the new fields which are being opened for American enterprise, and where new and extensive markets will eventually be opened for American products.

Extract from the journal of Eugene Roehen, corresponding member of the New York State Agricultural Society.

PROVINCE OF BARBACOAS, }
(New Granada), Canton of Tumaco. }

Various products.

Gentlemen.—Wishing to oblige the agricultural society in all things, I take an opportunity of so doing, and having but very little time to spare I take an extract from my journal, hoping that it may be of some service to the Society.

The Island of Tumaco, situated in $1^{\circ} 47'$ north latitude, and $80^{\circ} 53'$ west longitude, meridian of Paris, comprises a surface of two miles long and three miles broad. This is divided from the mainland, from which it is separated, by a small arm of the sea, of three or four cables length; in fact it is a small salt water canal, that does not interrupt the intercourse which exists between the two places.

The island of Tumaco, properly so called, is ascended at the entrance by a rock called Virgen, which at the low water is joined to another small island half a mile long (this Virgen rock is easily seen at sea from a distance of fifteen to eighteen miles). This little island, called the Morro-grande, is situated S. E., five degrees E.; it is itself joined to another little island extremely rich in vegetation, which is known by the name of Morro-chico, and supports a large number of cattle in proportion to its size. This is again separated from another little island called Viciosa, which is a most pleasant place of residence.

Viciosa is separated from the shore of Tumaco by a small current of water about 290 or 300 fathoms across; in this channel small vessels, drawing not more than seven or eight feet of water, can pass at high tide to the

entrance of the river of Tumaco, called the Mira. This passage is always dangerous on account of the rocks under water, which exist between the island of Viciosa and Morro-grande, these rocks, called in the country *Franças*, are situated north-east and south-west.

The shore of Viciosa is all of sand, and consists of high banks of sand for a length of more than two miles of beach. The boats of Tumaco are compelled to be constantly on the lookout for a large rock, called *Vinida*, situated in the west. This rock is entirely covered at high water; it is situated, in respect to the entrance, by the Morro-grande, or otherwise speaking of the entrance of the Tumaco river, north and south.

Tumaco, the capital of Canton, is three hours' sail in distance from the sea, for sailing vessels ascending the river, and is situated in the left branch of the Mira river.

The canton of Tumaco, that is to say, the island of Viciosa, Morro-grande and Morro-chico, contains a population of 3,000 persons, the town of Tumaco alone, contains 1,500 inhabitants.

Tumaco is bordered on the south-east by lagunes formed by the waters of the river; and it is nearly the same on the north-north-west; it is bathed by the river Mira. The entire length of the river is a journey of six days for canoes ascending the stream. The source up to the present time is unknown, but I cannot help thinking that it proceeds from *Pichincha*, a mountain situated in the Ecuador. The mouths of the river are three in number, Morro-grande or Tumaco, Manglara and San Pedro, more to the south; its breadth at Tumaco is about 500 or 600 metres.

The population of the province of Tumaco are kind and affable in their intercourse with strangers, although backward in civilization; they can, in a very short time, conform to the usages of strangers for which they show a great liking, and of which they admit the superiority; with good example they would soon become a most interesting people. The buildings of this part of the country, like those of all the provinces, are of wood; tainde chachajoar guayacan, which is imperishable. They are generally covered with plaintain leaves, the frame work being of wood, the produce of the country, and commonly of Chonta, which is plentiful and cheap.

These houses are built upon piles to keep out the insects and mosquitoes and snakes, which, however, are not so abundant as in the province of Choco. The height of these piles, which are generally of Guayacan, is about thirty metres and a half. Fresh water is procured from wells of three or four metres in depth, and is good and sweet. The tide running up for more than fifteen leagues, renders the water in front of the town brackish and unfit for domestic use. One of the great advantages of Tumaco, which I consider as the most healthy place of all South America down to Valparaiso, is that it is completely exempt from reptiles; a few centipedes and a few inoffensive little scorpions are the only noxious insects in the canton. Deers, goats and fallow deer are not wanted. Birds, with the exception of a few small parroquets are not found here in any great number; but in lieu, there is an excellent kind of venison which abounds.

There is agoutis or American hare, the flesh of which is white and very wholesome. The fish of the Mira river are of many kinds, very abundant, and very wholesome; there is a kind resembling the mullet of the north-east coast of Europe. Butcher's meat is very scarce, owing to cattle not being raised there, although the banks of the river would suit admirably for that purpose. Pork is plentiful and is the principal meat used, this with iguanas, yams and plaintains form their principal food. The winter or rainy season in the district of Tumaco is October, November, December and January; in February, March and April it rains a little, but much less in proportion; the summer is June, July, August and September. In September are slight showers of short duration. The heat, from the commencement to the end of the rains, varies from eighty-four to eighty-six degrees (Fahrenheit). This heat does not fatigue like that of Panama, situated more to the north, in eight deg., fifty-seven min., seventeen sec., west longitude (meridian of Paris). Earthquakes are rare, and I suppose that the one of September, 1840, was the only one of this century, and that is attributable to the vicinity of Pachincha.

The virgin soil, from one metre to 1.20 in depth, extends from Tumaco to the foot of the chain of the Cordilleras; this distance by water is six days' travel; there are no roads, and consequently no other means of communication. The products of the canton of Tumaco are hardwood for ship-building, and forty or more species of cocoa, pitch for vessels, and the produce of the honey-bee.

Tumaco produces the foregoing articles in great quantities, but agriculture is not much practiced; they want some one to teach and direct them.

Rice of good quality is generally cultivated in all the district, for the general consumption of the inhabitants. The rice plantations yield largely, on account of the facility of irrigation. The coffee is of good quality, and in size and flavor is equal to that of Central America. The sugar cane yields but little, it requires only to introduce a better quality, such as the little cane of the isle of Java, cultivated with success in the West Indies. The potato is not grown at Tumaco, but on the other hand, it abounds at Barbacoas and its neighborhood. The yam grows well at Tumaco. Tobacco is generally cultivated throughout all Canton, and is of good quality; the fruits are the same as in the West Indies, which are good and wholesome. Sheep thrive as well as cattle if they are shorn only once a year. Wood for carpenters' work and cabinet makers, of and for the construction of ships, of good quality, is abundant throughout the province there. Transport to the sea is easy on account of the number of small affluents that run into the principal river, the Rio Mira, as you will see by the forty-three specimens in the case, which I will have the honor to forward you through the kindness of Doctor Busteed, of New York city. Besides these there are many other kinds which I was unable to procure for want of time. For example, in the environs of Guapi and Escunde, at the north of Tumaco, where is to be found the cascol or black ebony, the white cascol, which I may call the white ebony, and the heart of which is as white and

as hard as ivory. Cotton grows well with care; with a better description of plant a handsome return could be made or obtained. Ships of 700 to 800 tons can ascend the river as far as Tumaco; nevertheless, all those destined for that port are accustomed to anchor off the Morro-grande, where the pilot meets to take them to the anchorage in the river in front of the town. The price of pilotage for a ship of any size, together with the port charges, amounts only to six dollars.

I should here observe, in passing, that from Point Eabra to the north-west as far as the Morro Tumaco, that large ships should avoid getting near the coast, on account of the number of shoals that exist in this district. The distance of high water is of more than eighteen or twenty miles in length, varying from eight to ten fathoms, and when in eight fathoms sounding, without indication, you may immediately run upon a shoal of two fathoms. From the Morro to Point Eabra, the coast is not navigable for other than small schooners or canoes of twenty or thirty tons.

Tumaco, for the beauty and safety of its ports, its proximity to the sea, the richness of its vegetation, its products, its very rich auriferous lands, its proximity to the rich mines of Manabi, Cachabi, Playa do Oro (in Ecuador), on the heights of the Mira, confines of the Tola, the short time that is necessary to go to the interior, to Esmeraldas, to Guayaquil, with which it communicates, and the which places are richly endowed by nature, might become by the aid of emigration, one of the most important points of New Granada.

Tumaco is little known and little frequented; the number of boats that arrive there and load wood and cocoa nuts and bamboos or madua, are not at present more than five per month, varying from twenty-five to sixty tons each, and with a crew of six or eight at most. The port of Tumaco is free from custom house duties; the most that foreign merchants pay is two dollars per month. The custom house is only used for merchandize intonated for consumption in the interior. This is a privilege enjoyed by all the other small ports of New Granada on the Pacific. Smuggling is very common. The custom house of Tumaco yields a revenue of \$15,000.

All the salt that is in the province comes from Paita or Lambayeque (in Peru). The port of Tumaco is the center port of Barbacoas, which is the chief one in the province of that name. The population of Barbacoas is 12,000. The construction of the buildings is in the same style as those of Tumaco.

Barbacoas is distant from Tumaco four day's sail by a canoe; it is necessary to observe that to ascend the river of Columbia, on which the chief town is situated, one is obliged to disembark to pass a tounge of land of one hour's travel across, and to carry on men's backs, the merchandize and baggage; on account of this journey, the place is called by the natives, the Arastrado. The load of the men or for ten men, consists of 4 arabas, 25 lbs. each, costs 4 reals. On the other side of the beach, canoes are to be procured to transport travelers to Barbacoas.

Barbacoas can be reached by water without the necessity of this

land transit, but it is tedious and dangerous, being a difficult and expensive journey of ten days. Barbacoas is the center of commerce for Pasta Calí, Popayan, where there is a mint, Tuqueros, which are themselves large places.

Barbacoas is situated on an auriferous soil, that extends many miles towards the N. The gold is met with in "Pepitas," which varies in weight from one drachm downwards, and its fineness (litre) ranges from 22 to $22\frac{1}{2}$ carats; this gold is found in a yellow ocher clay, strongly charged with oxide of iron in all its veins, and almost all the lands throughout are of a similar nature. The Clinger mines, for example, in the vicinity of Barbacoas, were worked before the emancipation of slaves, by 250 laborers, and yielded, on an average, $6\frac{1}{2}$ arabas of gold per year (about \$50,000) per annum; it is not now in operation. Tumaco is itself surrounded by auriferous veins, which, without being very rich, deserve to be again explored, as they give about $3\frac{1}{2}$ ounces of gold of $2\frac{1}{2}$ carats fineness, for every 1,000 lbs. of sand. Thus, for example, the sand of Curai of Cuello Grande, on the coast to the north of Tumaco, yield the result I have just mentioned. The earth of Stroam Quebrada de Cascajol, from east to west, going to Satahonda, is all more or less auriferous for a distance of four leagues, that separate the river Curai from the Stroam Cascajal. The nature of these veins is yellow earth, mixed with argil in many places, and throughout charged with oxide of iron.

After Point Labra, going northward toward Iscuandi, it is eight day's journey into the interior; the auriferous earth is highly charged with gold of about 21 carats fine, mixed also with platina. At one day's journey to the town of Guapi, auriferous earth is to be found, and the gold is of the same fineness as that of Iscuandi.

At the head of the river Guapis, ascending the river Napi which you leave to the left, that is to say, to the southeast, you arrive at the rich mines of Pizue, where the matrix is a yellow quartz mixed with oxide of iron, and with copper in many places; this gold is of 22 carats fine. Pizue is three days' journey in canoe, from the town of Quipe. Returning from Guapi, and proceeding northward on the coast, one day's journey by canoe, a mine not less rich than that of Pizue is found; this mine is called Timbizui. There, as at Iscundi, Guapi and Pizue, the mine is neglected and difficult to find, for after the emancipation it fell into disuse for the want of hands to work them.

It is observed that as you proceed north to the river San Juan, the gold becomes more impure and mixed with other metals, among which platina predominates. The specimens procured were not more than 16 carats fine, whilst those of the auriferous earth of the interior, were seldom under 21 or 22 carats. Near Tumaco, distant a few hours' journey, at the head of the Chilni, a quartz rock exists, charged with oxide of iron, and extremely rich in gold, but it is impossible to obtain it without great labor. I would observe that in all the small places I am speaking of, the population is very jealous and envious of strangers, and that for

the purpose of exploring the locality I speak of, it would be desirable to procure a concession from the government. A company neglecting this precaution exposes itself to annoyance, and to the petty local authorities. At Tumaco and Barbacoas, the easiest way, in my opinion, would be to pack the auriferous earth into barrels and send it to Eima or Valparaiso, for in some of these places the climate is debilitating and generally tells even on robust people. The same remark may refer to the auriferous sand of Curai; the distance between these two places is five miles by the seashore. On two points of this coast, at the depth of from 1.20 to 2 metres, you arrive at a "tuff" on which rests a layer of dust of oxide of iron, that contains a great deal of fine gold, easily distinguished by the naked eye; but those two points present much danger to the traveler, in consequence of the shore being lined with rocks of the height of 60 metres, extending a distance of 7 or 8 cable's length, and overhanging the sea at an angle of more than 35 degrees. The action of the water in the fissures of the rocks, causes portions of the rocks frequently to give way, which renders it very difficult to collect the sand. But the richest deposit of curai are at the head of the stream, from which the river rises, one day's journey from the last habitation on the river. The mouth of Estero de Curai, is a day's journey in a canoe, from Tumaco. At the foot of the stream which I have mentioned, the earth is impregnated with the same sand as the river. It is ochreous, mixed with oxide of iron, and containing here and there masses of silicious pudding stone, mixed with argillaceous earth. This does not offer any great resistance to the pick in excavating. To ascend to the Quebrada it is necessary to employ a small canoe, as the stream is very shallow and obstructed in some places by large trees.

I took notice of 43 specimens of timber, of which some are unknown in Europe. The kind of which there are ten varieties, one red, the color of the Ando nut, the other bright scarlet. Many of these trees yield rosin and gums, as I practically know, and they are worthy of being examined. As for example a *sanda*, which produces *seche de sanda*; this is a valuable remedy for quickly healing cuts and other wounds. I took a piece in a solid state, but when freshly extracted, it is used to make a drink. It is exported to Eima, from the province of Smeraldos, where it is so plentiful that it can be procured at \$1 per quintal. The Ando is a tree of from 40 to 60 centimetres in diameter in the middle of the trunk, while the head extends to 30 or 40 metres in diameter; the oil extracted by incisions from the *maria*, of which the masts of ships are made, preserves iron from corrosion.

The *Machire* produces a rosin that quickly cures the leprosy. The *borirache* of Quito is more efficacious than that of Europe. The *mangle* that produces a fine dye of a reddish color; the *beldaco* is used by the Indians for the same purpose as extract of *satuin*. It is best when infused in water of 120° temperature, and quickly cauterizes the sores. The *pachiacha*, the fruit of which is wholesome, and when fresh yields an indelible color of a beautiful violet shade; the *chapin*, on incisions, yield an oil agreeable to the taste; the *China root*, united with the *pilpe* plant, in

doses of from 20 to 25 drachms of each, is used in female complaints; the pilpe, taken in large doses, is highly poisonous. The resin of the palo-santo is used by the Indians for candles, with a wick of straw; a black wax, produced by a bee, may be useful in commerce; the yellow bee, which is something like our real bee, produces an excellent wax for ship use, that in a hot climate is preferable to the pitch of commerce. The pute of the neighborhood of Pasto and Barbacaos, is equal if not better than quinquina, of Bolivia. I wish to call attention particularly to this article of commerce.

The Cascarilla of Barbacaos, is also worthy of attention, and is equal in quality to that of Ea Poy, in Bolivia. The gums of the Machire which I mentioned before, possess the same property as the tree; this gum dissolved in a little alcohol, promptly cures the scrofula, and the most obstinate cases of leprosy. In difficult cases, the Indians wash the part with a solution of vorce de boddaco. The poisons of gum de palo lucho tree, joined with a substance extracted by incisions from the tree called Barbasco de Castillo, produces instant death from the slightest wound on the skin, and is more active than prussic acid. The fruit of the zagua is the grains; when they arrive at maturity, yield a fine dye of a beautiful blue color, the skin gives a black dye; the canello counteracts the poison of snakes, it is used by placing upon the wound scrapings of the wood, and taking 30 to 40 drachms infused in half a glass of alcohol diluted with water; the urita teridara, a species of cureuma. Cotermorico is very abundant in all the province and along the whole coast, from Tumaco to Chirigus; it gives an excellent dye of orange color, and it is at least equal to that of the East Indies, and can be procured at a low price. Qalkon, in doses of an ounce, produces great derangement of the intestines, presenting all the character of poison; the Indians, however, use it as a purgative. I also found an odiferous balm produced by a small tree unknown to me, it is called by the Indians (marcaopajaco;) the distance from Papagan to the village of Mocoa, where this is found, is six day's journey; this resin is abundant and easy procured.

The four provinces of the Isthmus of Panama, adjoining the province of Barbacaos, named, 1st, Province of Panama; 2d, Aznero, which includes the Darien, which is very interesting; 3d, Veraguas; 4th, Chiriqui, are most productive; and I consider the part on the Pacific of New Granada, as the most abundant and richest part of the globe, respecting medicinal plants, but very difficult to be continuously explored, the climate being unhealthy, hot and damp; no man has explored those provinces a longer time than myself; references respecting that may be obtained at the newspaper Star and Herald, of Panama. I have explored them on three different trips, and described them, but being always short of time, I have described them only by fragments, which the State Agricultural Society may have in case it should be of any interest.

In my last trip to the Darien, where I was sent by the French consul for a law suit between two companies, to survey three mines, Sambre,

Mogue, Morea, I found a lake undescribed on any chart, and measured the greatest altitude of the lowest part of the Cordillera in that latitude, between Chiman, Fort Principe and Caledonia; which distance I crossed from sea to sea, in 14 hours on foot; and I found only 314 metres for the greatest elevation. Then *I maintain*, as I did in my written report to the French consul (which is at the Ministère des Affaires Etrangères, in Paris, and Ministère Marine and Colonies, 27th of January, 1855, *that an inter-oceanic canal is possible* between the two oceans, there and at some other points of New Grenada familiar to me. Lt. Strain and his party, and others, did not know at all the country when they went to explore the Darien; however I maintain the possibility of an inter-oceanic canal.

Yours, truly,

EUGENE ROEHEN.

Naturalist, Traveler, Corresponding Member of the

N. Y. S. Ag. Society

PLEURA PNEUMONIA.

The appearance of this alarming disease, in a most virulent form, in this country, has excited much interest among our farmers; and it is desirable that all the information which may tend to furnish facts in relation to the disease, its origin, and treatment, should be given to the public. This disease has prevailed in Europe for many years, often causing immense losses—and although various remedies have been resorted to, some apparently successful in one locality, yet failing in another—there has, as yet, been found no certain remedy for the disease, so far as we have information. Destruction of the animals affected, as soon as the disease makes its appearance, has generally, we believe, arrested its progress. Few, however, are familiar with the symptoms of the disease, and when it has made much progress, it is very difficult to arrest it.

The annexed article, read before an Agricultural Society in England, giving, in a plain and familiar manner, a brief history of the disease there, from 1842 to the present time, we have thought would be useful to our farmers, and would lead them to take measures to guard against the spread of the disease, should it make its appearance in their vicinity. It contains many interesting facts, of the origin and progress of the disease—the symptoms which usually accompany it, and the various remedies which have been resorted to. Much interest is manifested in England and upon the Continent, in relation to the best means of arresting this disease. It is to be hoped, that investigations which are being made abroad as well as in this country, may lead to some discoveries which may prove advantageous.

J.

PLEURO-PNEUMONIA.

By Mr. PALIN, of Tarvin, Cheshire, England.

The "Pleuro-pneumonia" made its appearance in this county, in its formidable character, about the year 1842, and at that time it carried off the greatest portion of many valuable stocks of dairy cows. In consequence of such a serious visitation, cattle clubs were formed in different parts of the country, for the protection of farmers from that disease alone; and two other societies were established in London for the same object. So alarming did it become, in a very few years, that the Royal Agricultural Society of England, in 1847, offered a prize of £50 for the best essay on "Pleuro-pneumonia." Several essays were sent in, and the prize was awarded, in 1848, to the author of an apparently clever, well-written

essay ; but, it is much to be regretted, it threw very little light upon the subject, and I greatly fear that the country, after an experience of eighteen years, is quite as ignorant of the cause or the cure as it was at that time. If the disease usually made its appearance at any particular time of the year, or under any visible peculiar circumstances, we might possibly form some idea at least as to the cause ; but we hear of its presenting itself at every period of the year, without exception, and under almost every circumstance, in all kind of seasons and situations, where cattle are in high condition, and where they are in low condition ; where they are well managed, and where they are badly managed ; in fine, dry weather, in very hot weather, in cold frosty weather, in mild wet weather ; upon every description of land, from the driest sand to the wettest clay, (and I believe if there is an exception, it is in the hilly districts of Wales, Scotland, Derbyshire, &c.,) and this, too, where farmers have been most cautious in introducing fresh cattle into their stock.

The symptoms, too, vary considerably ; an altered gait in walking, as if from stiffness of the limbs, is frequently one of the first indications of the disease ; sometimes a peculiar and unmistakable grunt, at others a failing of the milk, soreness of the udder, and tenderness of the spine, quickness of breathing, short cough, horns alternately hot and cold, suspension of rumination, costiveness, partial loss of appetite, which gradually diminishes until it is entirely gone (and yet I have known instances where the appetite has continued until the end, when the animal has dropped down dead whilst eating). It is a much more serious business when the disease enters a dairy stock than a feeding one, especially if, as is generally supposed, the flesh of the animal is not unwholesome, but fit for human food, for although a milking cow may be of great value to her owner for dairy purposes, she might be worth little or nothing for the slaughter-houses ; and there is also the danger, if not the certainty, of abortion during six or eight months of the year, i. e., in every decided case of "Pleuro," either from the effects of medicine or the disease itself ; but as regards feeding animals, assuming that the flesh is not unwholesome, the loss would be trifling, as compared with dairy cows, provided the animals were slaughtered immediately on being taken.

I believe the "Pleuro" made its appearance in England previous to the year 1842 ; for, to the best of my recollection, it broke out in Yorkshire, and some few distant counties, before it found its way into Cheshire, and from a memorandum in my own possession, I find that previously to forming a cattle club in the parish of Tarvin, for protection against that disease, two stocks of dairy cows in the neighborhood having then been attacked, a preliminary meeting was held at the "Bull's Head Inn," Tarvin, on the 24th December, 1842, for the purpose of taking into consideration the propriety of establishing such a club ; and on the 10th of January, 1843, the club was actually formed, and it continued to work remarkably well until a few of the principal members became dissatisfied because it did not protect them against all losses, but confined itself solely

to the "Pleuro;" and in consequence, the club broke up, and many of its members then joined the "Mutual," or the "Agriculturist," two London offices, the latter a proprietary one, which, from want of experience and good management, soon broke up also; several other clubs and insurance companies were soon formed, and from increased experience and a better system of management, are undoubtedly working better than formerly.

As regards veterinary or medicinal treatment, during a period of eighteen years, we cannot expect much success until one uniform system of treatment is adopted, based upon scientific principles and a thorough knowledge of the disease from its commencement; but here we are at a loss. No one appears to know for a certainty whether the attack and one or more of the symptoms are simultaneous, or whether the disease generally lurks in the system for some time previously to the symptoms manifesting themselves; nor is it generally agreed where the disease commences, some contending that it commences in the pleura, and then spreads to the lungs; others, that it has its origin in the lungs themselves. There are also others, of considerable professional experience, who are of opinion that the disease originates in the blood, and that the first steps should be to endeavor to thin and purify the blood in the very earliest stages of the complaint. These are points which I do not pretend to determine; but having examined a great number of cattle after death, I think myself justified in stating that I have generally found the pleura much inflamed, and one division of the lung in a highly gangrenous state, and the other comparatively healthy; but in every case the appearance was such as to lead me to believe that the affected lung could not possibly be restored to a healthy state by any medicinal treatment. At the present day there are advocates for severe bleeding, as the "Sheet Anchor," and from a combination of powerful medicines down to homœopathy, in which bleeding is strictly forbidden; and, according to my own observation, about an equal number have recovered under each kind of treatment, and where they have not been treated at all, probably one in every seven or eight. Others are of opinion that the disease arises from the use of bone and our several new manures; but their opinions will also appear fallacious, when I state the fact that on many farms where the disease first appeared, neither bone or any new manure had been used; and on one farm, which was visited by it, in its most malignant form, in 1847, at least two-thirds (50 acres of its dairy pasture had been bone-manured in 1838, about nine years previously,) without a single case of "Pleuro" having manifested itself between these two periods, although the disease carried off about half the dairy stock of an adjoining farm early in 1843 (nearly five years before), on which bone manure had not been applied at all. Many persons doubt its being infectious or contagious, but the circumstance of its spreading through a stock, when once it makes its appearance, to the annihilation generally of one-half or two-thirds of its number, leads to the inference that it is infectious, although it frequently happens that where animals are kept in close contact with diseased ones, one-third or more escape. It generally makes its

appearance as an epidemic or epizootic, attacking several stocks in the neighborhood about the same time, and this, I think, may be attributed to some atmospheric agency. Can anything be done to arrest its progress? There will not, I think, be a question in your minds as to its effect upon the price of animal food, and dairy produce, especially when you are informed that on an area of less than three square miles, within a short distance of Chester, upwards of one hundred and twenty dairy cows have fallen a sacrifice to the disease in the short space of about eight months; and if it progresses in this ratio for a few years, or even a few months, it must tell a fearful tale upon the stock of this country.

I think that a searching investigation should be commenced at once; but this important step cannot be taken by any private individuals, or even public body less than the government itself, or under its direction and support. It would require the greatest amount of talent and experience that could be brought to bear upon it, and there must be a very considerable pecuniary inducement offered, to bring out men of talent, eminence, and integrity, to devote so much of their valuable time as would be required in such an undertaking; stocks of cattle would have to be visited, in different parts of the kingdom, subjects would have to be purchased from infected stocks, diseased ones in their different stages of the complaint, apparently healthy ones from the same stocks—some for the purpose of being slaughtered for examination, others for experimenting upon. Perfect illustrations of the whole of the internal organs, connected in the slightest degree with the disease, showing the interior of the different vessels, as well as the exterior, would have to be given; the condition of the blood, both in diseased and apparently healthy subjects in diseased stocks, and also of undoubtedly healthy cattle, from districts where the disease had never appeared, would have to be reported upon, and the services of some of our most eminent professional men would have to be secured to assist in adjudicating upon the momentous question, Can anything be done by human agency, to arrest in its progress the much-to-be-dreaded scourge, "Pleuro-pneumonia" in cattle? How is this to be accomplished? Not by private individuals, not by public companies, nor by the Royal Agricultural Society of England, but by the government of the country, who might call in the aid of the Royal Society to assist, if necessary, in arranging and carrying out the scheme. As I have before said, considerable pecuniary aid would be required, to carry out the scheme satisfactorily; therefore the plan I suggest is, that government, being the bearer of the public purse, should offer three prizes for the best essays on the "Pleuro-pneumonia" in cattle, viz., one of two thousand pounds, one of one thousand, and one of five hundred—of course under certain conditions and regulations; and I fully believe that the Royal Agricultural Society would render all the assistance in its power to further the objects of the inquiry. To show the view government took of a disease amongst cattle, called the "Malignant Epidemic Murrain," about the year 1745, I quote the following passages from a valuable work upon cattle, and their diseases. After

speaking of its devastation in the neighborhood of London, and some of the midland counties, it says:

"For more than twelve years it continued to lay waste the country. The number of beasts that were actually destroyed by it was not, and perhaps could not, be ascertained; but in the third year of the plague, when the government had so seriously taken up the matter as to order that every beast that exhibited the slightest marks of infection should be destroyed, a remuneration being made to the owner, no fewer than 80,000 cattle were slaughtered, besides those which died of the disease, and which formed, according to the narration of one of the commissioners, nearly double that number. In the fourth year of the plague, they were destroyed at the rate of 7,000 per month, until, from the numerous impositions that were practiced, this portion of the preventive regulations was suspended. In the year 1747, more than 40,000 cattle died in Nottinghamshire and Leicestershire, and in Cheshire 30,000 died in about half a year."

Surely, after such an example by government, upwards of a century ago, our present government cannot well refuse its aid, by the advancement of a few thousand pounds, in endeavoring to ascertain the cause and cure of a disease, not so dreadful perhaps in its character as the murrain, but fatal in its effects to a fearful extent, almost ruinous to individuals, and seriously affecting the whole community. It appears that England is not the only place where the disease exists at the present time, and I quote the following passages from a London paper of the 10th inst.: "A communication was received by the Royal Agricultural Society, at its last meeting, from the Central Society of Agriculture in Belgium, requesting information on 'Pleuro-pneumonia,' and the means adopted to combat the disease, having particular regard to inoculation. A reply was ordered to be made, that inoculation was not found, in this country, to rest on any scientific basis, and as such, it has not received the sanction or support of the Society." In this country, no statistics of the number of cases of "Pleuro pneumonia" have been kept, and consequently little is known of the number of those of inoculation. Some time ago, experiments were made upon cattle by inoculation, but I never heard of any very favorable results; and I think if the experiments had been tolerably successful, the public would not have been kept in comparative ignorance on such an important matter; and it certainly appears strange, that such a mode of treatment should have been resorted to, i. e., to introduce so malignant a disease into the system of a healthy animal, which might possibly escape the disease altogether; for I think it will bear no analogy to the system of vaccination in the human subject, for a mild kind of disease was in the first instance introduced into the system from the cow, with admirable effect, for the purpose of arresting that dreadful disease, the small-pox. Formerly, the small-pox itself (until the discovery of vaccination, by Dr. Jenner,) was introduced into the system of human subjects by inoculation, and frequently lamentable consequences ensued, which I fear would be the case if inoculation was resorted to in "Pleuro." And now the question

again presents itself: Can anything be done to arrest the progress of "Pleuro-pneumonia," carrying away, as it does every year, some thousands of valuable dairy and other cows? It appears to me to be worth the experiment I have presumed to suggest, and if successful, the public would be well repaid for any pecuniary assistance government may think proper to advance in the undertaking; and if, on the contrary, it should prove unsuccessful, the country will, I think, be satisfied that everything that can be done has been done, and that we must in future look to an All-wise Creator for that comfort and support, under the infliction, which He alone is able to give.

THE POTATO.

The cultivation of the potato so as to prevent the injury resulting from the disease which has been so destructive both in this country and in Europe, has called out many valuable articles through the Agricultural press. So important is this subject, of such vital interest to the farmer, we deem it desirable to place before our farmers such information as may be useful. We give a very valuable article on "the cultivation of the Potato and its preservation from disease," from the Mark Lane Express, by Professor Tanner, who has contributed many excellent articles on agriculture for the English press. His description of the disease, its probable cause, and the means adopted to prevent its occurrence, are so plain and intelligible as to commend his article to the attention of our farmers. Although the climate of Great Britain is different from ours, the method adopted to secure healthy tubers, may as well be applied here as in that country. The manures to be avoided as well as those to be used—the selection of seed—the preservation of the tubers after they are taken up, as given by Professor Tanner, are worthy of attention, and will undoubtedly, if practiced, lead to important results in the culture and preservation of the potato.

J.

THE CULTIVATION OF THE POTATO, AND ITS PRESERVATION FROM DISEASE.

BY PROFESSOR TANNER.

The value of this root was never fully known until the appearance of the well known potato disease caused great losses, and much disappointment to accompany its general cultivation. The alarm which at first filled almost every one's mind has, since then, subsided into calm, and every succeeding year has added fresh information upon this peculiarly interesting topic—the potato disease. I purpose, therefore, to notice the general character of the disease, and then proceed to the field management of this crop in different districts, and the modifications in practice, which have been introduced in consequence of the disease.

In 1843 the potato crop in America was much injured by disease, and some few instances were observed in England in this and the following year. It remained for 1845 to reveal the fearful loss which this disease was capable of producing. The weather had been remarkable during the summer of this year for a large amount of moisture, both in the form of vapor and in rain, accompanied with a more than usually clouded sky. From the 1st to the 10th of August the sun gained more power, and the

moist atmosphere, combined with this increased warmth, caused a luxuriance of growth in the potato crop, almost unparalleled. These hot and humid days were after this date succeeded by cold, and in some places frosty nights, and the consequence was that the potatoes were very generally struck with disease, so that within ten days almost every part of England joined in the panic-stricken cry, "The potato crop is destroyed." Those districts in which the potato formed the staple food, were threatened with famine, and but for the praiseworthy exertions then taken by all classes of society, the horrors of famine would been far greater than they were.

The loss and alarm thus occasioned led to the substitution of other crops—but in Ireland, where the sole support of the greater part of her population was potatoes and milk, this could not be accomplished immediately, and for two or three years great misery and distress prevailed. The Royal Agricultural Society of England was actively engaged, immediately after the appearance of the disease, in stimulating the introduction of remedial measures, and through her officers and other scientific men, investigations were instituted into the cause of the disease. From that day to the present time some degree of mystery has shrouded "the cause," although many imagined that they knew the cause, still exceptions could in each case be produced to show that other agencies had been in operation.

These investigations, followed by subsequent examinations, bring the cause under that extended term "atmospheric agency." Those who advocated that guano and other manures, or the growth of fungi, or the development of animal life, had, in their respective opinions, been the cause, have since then seen cause to regard them either as results, or else as promoters of the disease, rather than the cause. The true cause is, doubtless, wrapped up in the term "atmospheric agency;" and until we are more fully acquainted with the subtle influences here combined, and have some clearer views of their individual powers, we shall be unable definitely to explain the agency employed. There are, however, many who will be disposed to go with me even beyond this point, and view this disease as a remarkable visitation of Providence, intended to produce the most important results, and accomplished by the command of Him who rules and governs the operations of Nature, and at whose will the powers of the atmosphere became the agent employed for this purpose.

It would be a tedious task were I to recount to you the various causes which have been named as producing the potato disease. I shall restrict myself to that explanation which I consider bears upon it the impress of truth and which admits of proof. But before we notice this, it may be desirable to record the influence exerted by the disease. There is a great diversity of opinion as to whether the leaves, stem, or roots are the first affected. It admits of easy explanation why this difference of opinion should exist so far as regards the leaf and stem; be that as it may, the plant becomes discolored in a great or less degree; the leaves and stalks soon fall, becoming rotten and particularly offensive; the roots, after show-

ing spots in the skin, gradually decay, and in the change become dark in color, mucilaginous or gummy in condition, and finally become a putrescent mass. These changes take place with greater or less rapidity according as other circumstances promote or retard the action.

In assigning a cause for this disease, I am disposed to accept that given by Professor Way, viz., that the sap of the potato when exposed in the leaf to the atmosphere became altered in its character by the atmospheric agency producing the disease. As this altered sap passed through the plant, so it carried with it the elements of decomposition which produced the results described above. To enable the general reader to understand this as clearly as possible, I must give some explanation of the composition of the potato. The root contains a very large proportion of starch, which is the natural supply of food for the plant's early growth. The eyes or germs of the potato, which are observable upon the surface, are the points from which the new plant springs. When these germs are about to grow, food is necessary for enabling them to exercise the energy of life; but as the root consists chiefly of starch, which is not capable of entering into the plant, Nature has provided for the formation of a decomposing agent (which is known as diastase) around the germ, and this body changes the starch of the potato into gum or sugar, in which form it is useful as food for the young germ. This powerful agent is formed in other seeds, and the value of the process of malting barley depends upon its formation. The reader will probably be more familiar with it when I say it is a body which is produced in malt, and which is its active principle or real strength. Naturally, this is formed only around the germ of the potato, but Professor Way discovered that the disease caused it to be formed *throughout the plant*. We are all aware that *cold* can so alter the composition of some portions of the potato as to produce this agent throughout the root. This is quite unnatural; for in the healthy growth of the potato this body is only found around the germ or eye, and never throughout the root. To prove that cold will effect this change, I need not give you any stronger proof than the influence of frost upon potatoes. When potatoes have been exposed to the frost, and they are afterwards boiled, they become sweet to the taste; this sweetness is due to diastase having been formed, which has turned the starch into sugar. This chemical change which occurs in the root is known to have been produced in the growing plant by the disease, and this is the earliest effect observed.

The presence of this active decomposing agent is enough to account for all the changes which naturally occur. The plant has thus been charged with the elements of decay, and it only needs favorable circumstances to develop the destructive powers which are hidden there. It is well known that moisture and warmth caused rapid decay; but when the roots were kept dry and cool, they remained good for a longer period than usual. As soon as this agent was formed in the sap, it was diffused by the circulation going on in the plant, and thus became generally distributed. This early formation also accounts for the disposition to sprout which has been mani-

festes so much earlier than usual. We may also gather another explanation as to the opposing opinions held, whether the stalk or the leaves first become affected. The change was without doubt produced in the sap as it circulated through the leaf; if its movements happened to be slow, the leaves would probably be the first to show signs of decay; whilst if the motion was rapid, the sap would pass on into the stem, and there commenced its decomposing influence.

This view of the case is somewhat confirmed by the fact that *the potato disease has been produced artificially*, as recorded by Mr. Graham in the *Journal of the Royal Agricultural Society*, vol. vii, page 372. It is also worthy of notice that Professor Way showed that potatoes might appear perfectly sound, and yet if this agent had been formed, they were sure to give evidence of the disease. Thus, in some cases, under careful management, the diastase was kept inactive for months in those roots which were preserved cool and dry, whilst to all appearance they were free from disease. After the tissues of the plant become acted upon and their decay has commenced, then fungi and animal life come under observation; but they never precede the chemical change already described, and must therefore be looked upon as subsequent results of still later occurrence, and certainly not in any way the original cause of decay. This explanation of the disease appears to my mind clear and simple, and it does not need the adoption of any novel views, for the results are traced to the action of a decomposition arising from chemical changes produced in the sap by atmospheric agency.

This is a very brief description of the potato disease; and now we may notice the means adopted to prevent its occurrence; but this embodies the general management of the crop. The entire system of culture has now for its primary object to avoid this disease, or to mitigate its attack. There are no special means adopted to prevent this disease, but such as come under our notice in the management of the potato crop in different districts, to which I now draw your attention.

The culture of early potatoes for the London market is a special branch of the practice, and needs very particular management to ensure success. Three conditions appear necessary for success; a favorable climate; a dry, friable, and fertile soil; combined with good management. The districts most noted for this description of potato, are Cornwall and Lancashire, and in each of them proximity to the sea is of essential importance. The reason for this is that the temperature near the sea (especially on the western side of England) is less subject to variation, and the plants growing in these neighborhoods are thus protected in an unusual degree from the influence of frosts. Temperature is, therefore, the chief influence which gives superiority to these sea-side districts.

The character of the soil is as important as the climate, and the first condition is that the soil must be loose and friable. For this reason, the granite and greenstone soils of Cornwall, and the red sandstone soils of Lancashire, from possessing these characters, are very favorable for en-

couraging a free and unrestrained growth, and enabling the roots to spread freely in search of nourishment. Dryness of the soil is equally necessary—for in like manner as wet soils are cold, so also are dry soils warm, and this warmth is of extreme importance for producing growth in the spring. The influence of the sun upon sandy or gravelly soils is also very prompt; and in this manner the plant receives powerful supplies of this stimulant to growth. The last condition named, or the fertility of the land, is a manifest necessity; for rapid growth needs a liberal supply of food, and such as only fertile soils can yield. Thus the character of soil required embodies all those qualities which regulate luxuriance of produce; and when these are available under a favorable climate, then we have a soil suited for the growth of very early potatoes, and of course worth a very high rent. The rent in the districts already named, range from £10 to £15 per acre, and even at these prices the land yields very profitable crops. I am now only referring to the earliest class of soils, such as are found near Penzance and Morecombe Bay.

There is a great difference in the management of these two districts. In Cornwall, the general plan is to dig the ground by hand in autumn, and plant the sets in drills as the ground is dug; thus the earth dug from one drill is cast into the former drill. The early kidney potato is the variety grown; these they plant as early as October and November. After the sets are dropped, some earth is thrown over them, and then the manure being spread in the drill upon the seed, it is ready to receive the earth dug in the preparation of the next row. The manure preferred is a compost of farm-yard dung and sea-weed, &c. Nothing more is done to the crop until the spring, when the ground is flat-hoed in March. Potatoes thus treated, are dug early in April, but the general digging commences in May.

In Lancashire the system is different in many respects. The ground having been plowed in the early parts of the winter, receives another plowing in January or February, dry weather being carefully and promptly seized for this work. After this the manure is got ready for being used by being well rotted, for which an occasional turning is necessary. At the end of March, or very early in April, the manure, which is then thoroughly rotten, is cast over the ground, and the plow follows immediately. Some farmers then harrow the ground and plow again. With this preparation the potatoes are dropped in drills made by hand labor, as already described, and covered with soil taken from the next row. The manure used is somewhat similar to that employed in Cornwall; sea-weed and sea-sand are here also mixed with farm-yard manure, and valuable indeed they are as fertilizers of the land.

There is one point particularly worthy of notice in the Lancashire system, which is the great care taken with the potato sets in preparing them for planting, a practice worthy of more general adoption. In January the seed is brought out and spread upon floors, where it will be warm, so as to encourage a growth of the germ or sprout. Rev. E. F. Manby, in a valuable communication to the Royal Agricultural Society (*Journal*, vol. xviii,

p. 407,) upon the growth of early potatoes, says: "The cottagers bring their potatoes into their houses and place them under their beds. When these recesses are filled, they fill small baskets of the same kind as those from which the seed is planted, and hang them on hooks to the ceiling of their apartments down stairs, to obtain the advantage of the warmth of the fire, and then proceed to fill every possible place where they may be kept from the frost. If a man possesses a cowhouse or stable, the rafters are forthwith adorned with hooks, and the little baskets suspended. One of the largest cultivators has converted his hay lofts over his horses and cows into sprouting-rooms. Above these lofts he has laid a second floor, so that he is enabled to sprout double the quantity. The warmth arising from the cattle has been proved to be quite sufficient to keep out the frost. Care, however, must be taken that the sprouts do not become blanched and weak; they must have plenty of light. The tubers should not be placed thicker than two inches deep, or the root will become one mass of sod."

The sprouting of the potato before planting is an essential part of the system, for without this progress being made it were impossible for them to dig the crop in eight or nine weeks, as they usually do; and thus by the middle of June realize generally about £50 per acre for the produce. Besides the preparation in the sprouting, *very great care* is taken to secure lemon kidneys, and of the best quality. This is a variety without an equal for rapid growth and early maturity. After the crop is planted the work is entirely done by manual labor, consisting as it does of hoeing and earthing-up.

Whilst we must bend to the results of successful practice, as indicating a correctness of procedure, I think we may venture to say that both of these systems offer valuable hints. Excellent as the Lancashire plan is, it is just possible that if they copied from the Cornish plan, and planted in the autumn, they would have their crops ready earlier. The modification should only be introduced by way of trial; for as the more northern climate of Lancashire is colder, it may be that even proximity to the sea cannot sufficiently protect the crop. The influence of frost may, however, be very much diminished by additional earthing-up. Such are the advantages of having the crop even one or two weeks earlier, that any plan which offers the probability of rendering the produce earlier should be fairly tested. On the other hand, the Cornish growers may take a lesson from their competitors, by exercising equal care in selecting their seed, so as to prevent any degeneracy.

Nor are these the only persons who may derive benefit from the systems adopted. The superior value of these crops is a strong inducement to their growth, and there is no doubt but that many other farmers have land suitable for adopting this system. Along the extended line of coast possessed by the western side of England there are, doubtless, many spots of land which, if not equal to the Penzance and Morecomb bay districts, may still, under good management, be made to approach very closely, and pro-

duce highly remunerative crops. The soil must be dry, friable, and of good quality; and especial care should be taken in obtaining good seed.

The management of the main crop of potatoes offers many points of contrast from the foregoing; for whilst only special districts are suited for the production of early potatoes, almost every occupant of land is a grower of this crop. In Scotland and the north of England we find the largest and best cultivators of the main potato crop. A corn stubble is generally selected, and this being cleaned is deeply plowed before winter; and if it should be strong land, it is carefully laid so as to throw off the surface water. Early in the spring it is plowed, thoroughly well harrowed, and again plowed; in which state the land remains until the middle of March. The manure, which has been previously drawn to a convenient spot, has also by this time become well rotten. The land is then thrown into drills twenty-seven inches wide, in which the dung is spread, the potatoes dropped, and immediately after the ridge is split and the planting completed. The varieties chiefly grown are Scotch Duns, Perthshire Reds, Fifeshire Regents, Perthshire Rocks and Scotch Cups.

When the potato is growing, care is taken to keep the ground clean, the plants well earthed up, and the furrows deeply stirred; and thus additional mould is prepared for the next earthing. A thorough earthing up of the crop is looked upon as an essential element of successful growth. A similar system is carried out in different parts of England—in Yorkshire and Lincolnshire especially. In the two latter districts, the Regents and Fluke potatoes are extensively grown. An immense quantity of potatoes are shipped from these districts to the London market, which receives its main supply from this source.

The west of England was at one time a successful competitor in the London market, and the exports from Devon and Cornwall were surpassed by none. Since the potato disease commenced, this trade has gradually declined, until it has been brought into a very inferior position at the present time. The granite and sandy soils of these counties have long been noted for the quality of the potato grown, and parishes around the granite hills especially so. The moisture of the west of England climate, and especially its liability to fogs and mists, has operated as a great stimulus to the disease, and thus checked the cultivation of the potato. Now, however, that we have become so familiar with the disease, and have learnt the best plan to mitigate the attack, we may hope that this profitable branch of husbandry will again extend.

The practice adopted in some cases corresponds with the northern system, but the majority, after the second plowing spread the manure upon the land and plow it down, dropping the potato in every third furrow, so that the land remains flat. After the potatoes can be seen, the openings between the rows are well hacked over with a digger or two-bill, and thus a nice soil is prepared for earthing up the crop. In some cases the old fashioned lazy-bed system is practiced, and often with singular success. The plan is to spread the manure on the land, and then throw it into narrow beds about

three or four feet wide. In these beds the potatoes are planted simply by the use of a dibble, and the only care required is to cast upon the bed the earth from the rather wide furrow between the beds, and sometimes also to hand-hoe it slightly. Dr. Lang, in a very useful paper on potatoes, in the *Journal* of the Royal Agricultural Society (vol. xix), attributes the success of the lazy-bed system to the fact that in hoeing and earthing up the crop the minute tubers which are being formed between the rows are cut off, whilst on the lazy-bed plan they escape.

There is nothing objectionable in the lazy-bed plan if it be carried out with proper judgment. Indeed, I think we may secure its advantages without the disadvantages which are too generally connected with the neglectful management adopted, and hence the name given to it—the lazy-bed method. We may, however, practice the bed culture with success, and by our good management show that the prefix “lazy” is inconsistent. As an improvement upon the bed system I should recommend a corn stubble to be well cleaned immediately after the harvest; the dung should then be spread and plowed into the ground. As early in March as the weather will allow, let the ground be well scuffled, and then plowed into beds three or four feet wide, with half the width between the beds. In these beds let the potatoes be planted, and throughout the season kept *lightly* hand hoed. The earth in the furrows to be cast on the beds as the potatoes make their growth. Thus the foulness of the land, which is a cause of complaint against the old plan, may be avoided. It would be a very great improvement to apply some lime just before the land is scuffled in the spring. Its influence upon the land, and especially upon the dung already in the soil, will not fail to be most desirable.

The varieties chiefly grown in the western districts of England, are the early top, ash-leaf kidneys, American early, Regents, Forty Folds, and Cornish Kidneys; and each of these varieties is of good quality, but varies in time of ripeness and also in suitability to different districts. In the midland counties, in addition to some of the foregoing, the Lapstone Kidney, Walnut-leaf Kidney, Round Ash Leaf, Red Eye, and Flukes are favorite kinds. Much of the value of every variety depends upon its early ripeness. Experience has shown that those varieties which are the most perfect when the disease appears are the least affected by it. It is reasonable that such should be the case; for as the tubers become ripe, so do they cease to receive supplies of sap from the stalk; if, therefore, they are not receiving sap from the stalk, it is clear that they cannot receive the altered sap which is the cause of decay, and the first influence of the disease. Everything should therefore be done to get the crop ripe as early as possible, and the careful selection of early seed will be one means towards the accomplishment of this result.

This disease I have described as resulting in a decay of the organic matter of the plant. Now, a moment's reflection will show that fermenting matter, when used as a manure, is likely to encourage this decay, whilst an antiseptic manure would have an opposite tendency. This quite accords

with the evidence of potato growers, for dung when applied at the time of planting the potato, and especially if used rather long, is sure to encourage the disease, and the crop becomes more rotten in consequence ; but if, on the other hand, lime, or lime and salt are employed, the growth is encouraged, whilst decay is checked. When it is desirable to use dung for potatoes, it should be plowed into the ground before winter, and in the spring incorporated with it. After this no fear need be entertained of its producing any ill effects, but it will stimulate the growth of the crop and increase its produce considerably.

The use of lime, in the spring, will always prove a desirable addition. Guano is often employed as a manure for potatoes, and the usual plan is to sow it broadcast upon the ground, after it has been cast into ridges ; the potatoes are then planted in the furrow, and the ridges split. This is probably as good a way to use guano as any, when ridges are preferred ; but when potatoes are planted in beds, or when plowed in on the flat, I should rather be disposed to mix the guano with some ashes, and sow over the ground after the planting is finished ; damp weather being chosen for doing it.

Before leaving this notice of the manures used for potatoes, I must not overlook the great value of seaweed. If those who can get these supplies from the sea shore fully appreciated its value, it would be more regularly used than it is at present. It has a peculiar value for potatoes, in checking the tendency to and the progress of the disease. It may be used in its fresh state ; but it is far more effective when mixed with farm-yard dung, and both allowed to rot together. Manures, as they may be selected, prepared, and used for the potato crop, offer great opportunities to the potato grower, and by their judicious employment they will materially assist him in accomplishing the great object he has in view, an early and abundant crop.

Another point well worthy of attention is the sprouting of the seed, which I have already described as being done in Lancashire. In this way much progress may be made before the potato is planted, and this will have its influence upon the time for raising the crop. I am well aware some difficulty and trouble attends its adoption on a large scale ; still this must not stop its more limited adoption ; and when its advantages are fully known, it will remain with each individual to extend its adoption on a larger scale, as may appear to be desirable. So long as there is any tendency to disease, so long must we use every endeavor to secure early crops, Whilst we are noticing the selection of seed, I must draw attention to the connection existing between the seed and its produce. For a considerable time it was imagined that the produce of diseased seed was more predisposed to disease than crops grown from the perfectly sound and healthy seed. This opinion is not held only by a few. Viewing the disease as a purely chemical change or decomposition produced in the potato (by some cause not definitely known), and that this change occurs naturally in healthy

seed during its growth, although at a less rapid degree, there does not appear to be any just cause for considering that the character of the germ could be prejudicially influenced thereby, except as regards its supply of food. If the decomposition had proceeded so far as to cause the waste or removal of the nourishment, it is clear that the germ could not come to maturity, not from any tendency to disease it had received, but from a want of proper food to enable it to grow.

Mr. Thompson, of Moat Hall, Yorkshire, published some interesting experiments which he tried before the general appearance of the potato disease, which are remarkably instructive. The following table presents, in a condensed form, the results of these experiments, as recorded in the *Journal of the Royal Agricultural Society*, vol. vi., p. 165.

ROUND REDS.

YEAR.	Seed taken up.	Quality of crop.	Quantity of crop.
1840,	Ripe supposed, ...	Curled,	Failing crop.
1841,	Unripe,	No curl,	Good crop.
1842,	do	do	do
1843,	Ripe,	Curled,	Indifferent.
1844,	Unripe,	No curl,	Good crop.

BLACK KIDNEYS.

1841,	Ripe, supposed, ...	Curled,	Failing crop.
1842,	Ripe,	do	Light crop.
1843,	Unripe,	No curl,	Capital crop.
1844,	Ripe,	Much curled,	Very bad crop.

These facts show most clearly (and they are confirmed by other experiments) that for the production of an abundant crop it is quite possible for the seed to become too ripe. How this arises we may not be able fully to explain; but it is certain that when a potato has reached that stage which we denominate fully ripe, and indicated by its being mealy and flowery when boiled, that the tissues have become less firm and less nutritious than when they were less advanced, and consequently the least advanced appear soapy and close after cooking.

Cultivation may be looked upon as an artificial mode of forcing the growth and development of a plant, and the management of our potato crop has always been of this character. It would for this reason appear as if in our cultivation of the potato, we generally produce an over-grown seed—a tuber which has been forced so much that its tissues have lost strength, and this for the purpose of table use. We must carefully distinguish between this over-growth and ordinary maturity or ripeness. The latter term, *in its true application*, can never be unfavorable to any seed; but we have habituated ourselves to use the term “ripeness” of the crop, to indicate maturity for table use, rather than that earlier stage at which the tuber possesses greater strength and vigor.

It would for these reasons appear necessary to select seed in an earlier

stage of growth than that prepared for table use. To attain this result we must either obtain the potatoes from poor and heavy land, where the growth has not been forced, or else to plant potatoes late, on purpose to produce the seed required. The choice lies between these plans, and that of digging the seed from the general crop before it is ready for raising. The latter plan is found to be objectionable on account of the tendency of the seed to sprout before it is required. It may, perhaps, be said that these experiments only record the influence of the seed upon the curl in potatoes, and not upon the potato disease, with which we are all too familiar. Mr. Thompson, in the article already referred to, says: "The experience of this season convinced me that curl, dry-rot, and wet-rot, are one and the same complaint; that curl is a mild attack of the disease, which, when violent, destroys the set before it can germinate, and that it assumes the dry or wet rot according to the degree of moisture of the soil or season." To this I would add, that the present disease is believed to be only an aggravated form of the same complaint. The results are similar, but rendered more certain by the presence of the decomposing agent, as already explained.

In a recent communication, Dr. Lang advances the opinion, that "the disease is in exact ratio to the proximity of the tubers to the surface," and he gives several singular proofs. One experiment may be recorded here to illustrate the preservative power of soil: "On September 18th, 1857, three pits were made, ten inches deep, and about the same in diameter. Three white kidneys were placed horizontally on the bottom, and just covered with a little fine earth; and then another layer, similarly covered; and then a third layer; so that the whole consisted of three layers of potatoes, with just earth enough between to keep them from touching each other, and the uppermost layer about two and a half inches under the surface. A few diseased leaves and stems were placed on the pit No. 1, and then watered with half a small garden-pan of water, with a fine rose; pit No. 2 was watered with the remaining water; pit No. 3 had a large slate put on it.

"Sept. 28th, 1857—No. 1 pit had each of the three upper potatoes slightly affected.

"Jan. 23d, 1858—No. 1. Three upper potatoes quite rotten.

"No. 2. Three upper much affected.

"No. 3. Three upper not diseased.

"In all three pits, both the under layers were free from any taint."

The subject is very fully noticed by Dr. Lang, in the *Journal of the Royal Agricultural Society* (vol. xix., p. 77), and well worthy the careful perusal of those interested in the cultivation of this useful crop. He also states that in the digging of a considerable quantity of potatoes, none of those tubers covered with more than three inches of soil were found to be diseased. This is in some degree confirmed by the success resulting from the excessive earthing of potatoes practiced in some parts. It is certainly

a very gratifying fact to learn, and worthy of being taken advantage of in our practice.

The crop having been produced, we have to take the necessary precautions for its preservation. The tubers should be raised in dry weather, and should also be dry when put into the cave. In making the cave, a dry spot of ground must be selected, and a double row of four-inch drain-pipes should be laid along the bottom, so as to assist in ventilating the heap and carrying away the moisture arising from the stock. The heap should be brought to an apex, and continued in length according to circumstances, but it should not be more than five feet wide at the base. At intervals, small bundles of reed or straw (say six inches in diameter) should be placed from the bottom to the top of the heap, and then passed through the thatch. In this manner the air enters by the drain pipe and ascends through the stack, carrying with it the sweat from the roots, which if kept in would very much promote their rotting. When the frosty weather comes, these apertures may be stopped up. There should be a trench around the potato cave, so as to keep it perfectly dry.

THE PLAINS OF LONG ISLAND.

By WINSLOW C. WATSON.

The subject of the waste lands of Long Island has, for several years, engaged my earnest attention. Curiosity first induced me to visit the region, that I might examine with my own eyes, a territory which seemed to be consigned by public sentiment to desolation, and to be regarded as valueless for the purposes of husbandry. I was unable to perceive any sufficient reason why even a barren desert of sands, so contiguous to the best market on the continent, could not be profitably cultivated. I was naturally forced to contrast such an aspect in our own country, with the efforts of Flemish industry, which could wrest from the dominion of the ocean a naked sand beach, and convert it into the garden of Europe. The parallel was not grateful to my national pride. More than one careful examination of this district, in reference to its geological structure, agricultural capabilities, and local advantages, have confirmed the original impression, that no natural impediments exist, to the successful culture of these plains. A strange and inscrutable popular delusion seems to prevail very generally on this subject. Hereditary opinions seem to have taken singular possession of the public mind. These opinions have been probably adopted and been cherished without reflection, and without examination of facts, which are everywhere disclosed on the island. Historians of Long Island have assumed the same conclusions, and in asserting and diffusing them, have exerted a most injurious influence upon private interests and general progress. So decided have been these views, that until recent intelligent investigation had changed the policy, portions of these lands were deemed so utterly worthless, as not to be considered worthy of being placed on the grand list.

I might distrust the propriety of a stranger meddling with this local question, were it not that my views have been so fully sustained and fortified by the decided opinions of General Dix, expressed in his recent admirable address before the State Society. I have no possible interest in these lands, and can therefore speak with more freedom and impartiality. The facts and results upon which are based my convictions, I have collected with great care and vigilance, as well by personal investigations as from conversations with intelligent gentlemen, who are familiar with the subject. Among the numerous persons to whom I am under obligations, I may particularly refer to the Rev. E. M. Johnson, of Brooklyn, whose clear memory, in a green and vigorous age, enables him to trace the progress of

the island for nearly half a century ; to Mr. Harold, the intelligent secretary of the Queens County Society, and to Mr. Bridger, of North Islip, who combines with careful observation much practical experience in the cultivation of the plains. I should violate my sense of justice, were I not to refer especially to the services and efforts of Doct. Edgar F. Peck, of Brooklyn. From this gentleman, who for fifteen years has strenuously combatted the deepest prejudices and the most unyielding opposition, in his labors for the development of these lands, I have received the most important aid and information. I do not hesitate, in this connection, to adopt the words of an eminent gentlemen, who remarked to me : " If these plain lands are reclaimed and brought into successful culture, the result must be attributed to the zeal and intelligence of Dr. Peck, more than to any other cause." The convictions of Dr. Peck, as to the qualities of these lands, were derived from personal investigation, commenced in 1841, and subsequent results have fully confirmed the views then formed.

Long Island combines, perhaps, more peculiar and decided advantages for residence, than any other district of our widely-extended territory. The Gulf stream, approaching near to its coast, imparts to the climate a delightful temperature, that exempts it from the rigors incident to a northern latitude ; surrounded by the ocean, it rarely suffers from intense heat or droughts ; it is almost under the shadow of the towers of New York, and enjoys every facility of access to its market. Under such circumstances, the Island should exhibit the aspect of one prolonged cultivated farm, and orchard, and garden, smiling throughout its whole area, in that exuberance of beauty and culture, which so eminently mark some sections of its territory. These great and marked advantages early attracted the attention of the emigrant, and hence, for more than two centuries, Long Island has been regarded, not only by the partiality of its own people, but by the public verdict and the voice of the traveler and historian, as " The garden of America." This reputation, however, attaches to the island from the aspect of a narrow margin along the north and south shore, and small districts upon the eastern and western extremities. A very large proportion of the interior has been abandoned to neglect, and is at this day in a more desolate state, than it presented in its primitive condition, for the stately native forest has given place to the scrubby oak and to coarse and worthless vegetation.

I can the most readily explain and illustrate my views, by presenting a rapid sketch of the physical arrangement of the island, its natural capacities, and its existing condition. The formation of Long Island, in its physical and geological arrangements, is remarkable, and without any parallel. It is about one hundred miles in length, from east to west, with a general width ranging from eight to twelve miles. It is divided into nearly equal sections, by an elevated range of land, which traverses it longitudinally. This ridge subsides into the plain at the east, and in the vicinity of Brooklyn is broken into abrupt heights. Long Island presents no analogy to any adjacent territory, but in its natural arrangement is

peculiar and distinct. It is proper I should state, that my explorations were chiefly limited to the slope extending from the ridge to the ocean on the south, and to the western portion of the island. This range embraces that section of the territory to which my investigations were particularly directed, and afforded me, in the cultivated districts, the data I required for contrasting the soil of the plains with the fertile farms.

GEOLOGY.—The geological structure of Long Island discloses a remarkable similarity throughout its whole extent, which is rarely if ever found in an equal area of territory. The ingredients of the soil, in every section that I have been able to examine, and the same fact, I was assured on the most reliable authority, exists in every part of the island, exhibits the most singular uniformity. In these respects, and in most of its physical features, Long Island presents a peculiar arrangement that has no analogy to any other district within my knowledge, and indeed distinguishes it from all others. That it is alluvial, and of recent formation, there exists every proof. In my personal explorations, I saw no rocks in site, but perceive that geological authors refer to their appearance near Hurlgate and at Hallett's Cove. These doubtless reveal the croppings-out of the rock of the adjacent mainland. Huge bou'ders are scattered copiously in the soil at Brooklyn, and in other localities, but upon the plains scarcely a stone occurs over the size of a large pebble. The basis of the entire island appears to be a formation of large pebbles, worn and rounded by attrition. On this foundation reposes a substratum of small pebbles mingled with the superficial soil. Above this substratum occurs the soil of the island, ranging in depth from one foot to three feet, and it is a singular circumstance, which marks the anomalous arrangement of the whole island, that unlike every other territory, the soil is the thinnest and least fertile in depressions, than upon the elevated parts of the surface. The elements of this surface soil are as nearly as possible identical in every part of the island, but varying to some extent in its combinations. In some districts, where clay predominates, it may be termed a clayey-loam; in others, silex is the most conspicuous ingredient, when the soil becomes a sandy-loam. In some limited sections of the island, localities of pure sand are found, but through the center of the island, and particularly on the plains, I saw no appearance of a soil of that character. The greatest prevalence of sand, and the lightest soil I examined, was on the north side of the ridge, in the town of Smithtown; and the next, most assimilating to this, was in the Happaugh valley, in the same town. Both of these localities are upon farms which have been cultivated for generations.

The submergence of the island at some period is demonstrated by numerous circumstances. The gravel formation I have just alluded to, is a sufficient proof. Mr. Thompson, the historian, speaks of fossil remains being exhumed in digging wells, and the marine shell, discovered in the beds of the "Dry rivers," can be traced to no other cause. Possibly the foundations of the island may have been upheaved by some natural convulsion, but I have not scope to pursue this enquiry, and can only assume

the obvious fact, that the soil of the island is formed by a detritus, either raised from the bed of the sea, or cast upon the pebbly beach by the waters of the Hudson and the streams of Connecticut. The process by which the island may have been formed by this accretion, can at this day be constantly traced upon the sand reefs, which Providence has caused to be thrown up along the southern coast of the island, forming a vast natural breakwater, to which the low shore of the island owes its only protection from the surges of the ocean. The sea-sands first accumulate; upon these spring the coarse aquatic grasses, and these, in the memory of man, are succeeded by a nutritious vegetation. Such may have been the operations of nature, by which the uniform soil I have described was gradually spread like a mantle over the surface of the island. I was informed of a singular geological formation, which I was not able, however, to examine. This is a horizontal stratum of soil, about half a mile wide, ranging in a course northeast and southwest, through parts of the towns of Oyster Bay and Hempstead, and from its peculiar color, known as the "Red ground." It is enclosed on the west by a black earth, and on the east by the prevailing yellow soil. This red stratum is said to be remarkably fertile.

It is not necessary to invoke the aid of science, to determine the singular identity of the elements of the soil throughout the whole island. I collected specimens from the cultivated farms near Brooklyn, Smithtown, and on the south shore, and from the Hempstead plains and the Bush plains in various places. These specimens are deposited at the Society's rooms, and any person, by inspection, will readily determine their remarkable similarity.

CLIMATE.—The climate of Long Island is distinguished for its mildness and salubrity. These qualities become more apparent as the surface is opened by improvement to the circulation of air and the influence of the sun. Mr. Thompson states that the thermometer rarely falls to zero, or rises to ninety degrees of Fahrenheit. Its insular form, bathes the island perpetually in a marine atmosphere, which imparts a genial moisture, while, as I have remarked, the sea breezes mitigate the rigors of winter, and relieve the intense heat of summer. The influence of the Gulf stream I have already referred to, and I may add that this influence is augmented by the marked prevalence of southerly winds. The frost penetrates the earth only in a slight degree, and the surface is seldom covered by snow more than a few weeks in the season.

I found it to be the general impression with intelligent men, that the farmers of Long Island enjoy, on account of the mild temperature of the climate, an average of about forty working days in the year, more than those above the Highlands. This is a fact of great significance, in estimating the value of these lands for agricultural purposes.

It seems to be admitted that the island rarely suffers from drouth. The sea air, always charged with moisture, constantly refreshes vegetation. The Rev. Mr. Johnson spoke of the extraordinary dews which characterize the island, and which, he remarked, are not unfrequently so heavy

that the moisture they precipitate falls in drops from the eaves of the buildings. The celebrated Cobbett adverts to this exemption of the island from the prevalence of drouths, and observes: "I can truly say, as to the article of water, I was never situated to please me so well in my life before. The rains come in about once in fifteen days. They come in abundance about twenty-four hours; then all is fair and all is dry again immediately."

In the last sentence, he alludes to a singular feature of the Long Island soil. The inhabitants are seldom afflicted by mud. The thorough system of drainage which nature has provided in the under-stratum of gravel, carries off the surface water with great rapidity, and leaves the earth dry and pleasant.

WATER.—The water arrangement on Long Island, is marked by the same dissimilarity to other districts which is so conspicuous in every trait of its physical formation. Although the ridge is the natural water shed of the Island, few streams flow on the south side, directly from it. The streams generally start four or five miles from the ocean, sometimes bursting from a single fountain in pure and bright water, and at others gathering in almost stagnant pools. They uniformly, I believe, flow over beds of clear white pebbles, and never have bottoms of slimy, deep mud, which is usually so prevalent in flat countries. Most of the farms are supplied by wells, which are often of great depth. The water on the Island is sweet and sparkling, and commonly soft. On Fire Island, and other islands off the coast, of a sandy formation, wells dug in the sand at the margin of the sea, afford agreeable fresh water, and the cattle depasturing on these islands supply themselves with drink by pawing holes in the sand.

Stock are frequently furnished with water by excavations on the surface known in the region as "watering holes." They are a few feet deep, and nature appears to sometimes provide them, but they are more frequently contracted by puddling the soil. It is a singular fact and perfectly illustrative of the purity both of the water and atmosphere, that the water stands in these excavations throughout the summer, retaining a pure and limpid condition without taint or putrescence. A few swamps or marks appear on the plains, but they are limited in size and generally occur at the head springs of the streams.

I have thus presented a hasty outline of the physical features and characteristics which distinguish the entire Island. This sketch seemed to be necessary for a just and intelligent understanding of the qualities and peculiarities of those sections which I propose particularly to discuss.

THE HEMPSTEAD PLAIN.—We enter upon this tract in a progress from Brooklyn, soon after leaving the highly cultivated region in the vicinity of that city. These plains reveal one of the most remarkable exhibitions of nature in the Eastern States. Formerly they embraced in an open area, about 17,000 acres. The quantity is now reduced to about 12,000 acres. Unoccupied, uncultivated, without enclosures, they present to the eye a wide expanse, clothed in rich and beautiful verdure. This vast surface is almost perfectly level, interrupted by slight undulations, and stretching

from the ridge towards the ocean, by a declination so gradual as to be imperceptible. Scarcely a bush or tree interrupts the view. Nature formed it a broad, upland meadow. Its appearance recalls at once the memory of a Western prairie, and the herds of cattle ranging over it, which fancy may readily conceive to be the Buffalo, do not lessen the similitude. These plains are, however, destitute of one embellishment, which communicates to the prairie such exceeding loveliness. The brilliant flowers which at the west spread a gorgeous garniture over the earth and adds so much to the beauty of the scene, is wanting here. This circumstance is probably owing to the severe and continuous cropping for ages of the Hempstead Plains. These plains existed at the first settlement of the Island. They attracted the attention and excited the admiration of the emigrant. Travelers visited them at an early day, and referred to them as among the wonders revealed in the new world. The prairies of the West were then unknown to civilized man. By what agency these plains were produced, with their peculiar features, whether by man or accident, or the caprices of nature, was then, as at this day, a problem that cannot satisfactorily be determined. Some impute them to peculiarities of soil; others to different natural causes, and another class, with a more practical view, refer their existence to fires, continued for ages by the Aborigines, with the purpose of securing early grazing for the deer which thronged the Island. When the causes which created the prairies of Illinois, are revealed, we may look for a solution of this question. All the knowledge we can now attain is, that the grass plain exists—a phenomenon of nature and a miracle of beauty.

These plains are mantled by a rich and heavy growth of grass, which affords pasturage for large numbers of cattle. They were appropriated, and with great convenience and utility, by the settlers at a remote period, for this purpose, and the practice is still continued. They also afforded a valuable resort for procuring hay. Denton, in his account of New York, thus describes them in 1670: "Toward the middle of Long Island lyeth a plain, sixteen miles long and four broad, upon which plain grows very fine grass, that makes excellent good hay, and is very good pasture for sheep and other cattle; where you shall find neither stick nor stone to hinder the horses' heels or endanger them in their races."

Mr. Harold, in a valuable paper he kindly prepared for my use, states that "grass formerly grew on these plains five and six feet high, and is now occasionally found on neglected headlands higher than a four rail fence. The earliest grass (Secretary grass), a short and very fine grass, is much relished by sheep and cattle." The nutritious properties of the herbage growing upon the plains is apparent from the appearance and condition of the cattle which roam upon them.

The turf which covers these plains, by its toughness and tenacity, assimilates to the sward of the western prairies. Two yokes of cattle, or a team of three horses are required to break it up. An immense quantity of vegetable matter, convertible into rich manure must be contained in a turf possessing a volume like this.

The geological features of the Hempstead plains disclose a remarkable analogy to those of every part of the Island that I was able to explore. Mr. Harold thus describes the soil: "The level portions of the plain has generally a good soil, the top being from six to eighteen inches of vegetable mould, with a subsoil of loam varying from one to four feet in depth, underlaid in most places by a coarse gravel." The superficial soil is combined with a black humus, which must impart to it great fertility. The theory of some intelligent persons is, that this humus may be the deposit from the subsidence of a lake which they suppose covered these plains. I conjecture, however, that it is formed by the decomposition which the massive turf must be constantly undergoing. That streams of water have flowed along these plains is very apparent, but whether they were rivulets of fresh water such as now exist, or inlets of the sea, which at a remote period existed, cannot now be decided. The "dry rivers," as they are called, are peculiar features which prevail extensively on the Island, and are particularly distinct on the open plains. In Hempstead they are commonly used for the track of roads. They exhibit the meandering course and high banks common to all streams, and have hard bottoms and a thin soil. Common marine shells abound in these "dry rivers." Another striking peculiarity of these plains is the circumstance of streams gushing out on the surface in a full volume from their fountains. These streams are of considerable size, and afford water sufficiently soft for domestic purposes. Nearly all the mill-streams of the district are formed by these rivulets. Although the plains are not affected generally by dampness, the earth in the vicinity of these head springs is so saturated, without however exhibiting any appearance of a springy or swampy character, that water rapidly collects and remains in excavations dug on the surface. The territory known as the Hempstead plains formerly included a much more extended area than it now embraces. It was owned in common by the original town of Hempstead, and spread nearly from the base of the ridge to the village of Hempstead, and from Brushville, now Queens, to the Bush plains on the east. This town was divided in 1784 by a line running near the track of the Long Island railroad, into North Hempstead and what is now Hempstead. The policy of the two towns in regard to their common lands has been widely different. While Hempstead, by its popular vote, has persistently refused to sell that part of the common which lies within its boundaries; North Hempstead at an early day disposed of the portion which belonged to that town. Although such sales were made at very inadequate prices, the benefit to the town has been incalculable, by the increase of its cultivated area and the addition to its positive wealth and resources. It is not my province nor purpose to animadvert upon the course of the town of Hempstead, in respect to this policy, but I may remark, that an impressive practical commentary is presented on the subject in the aspect of fine and productive farms on the North Hempstead side of the plain, contrasted with the wild and uncultivated waste, only occupied by scattered herds of cattle, on the Hempstead common. The sale of this vast domain, at a just valuation, might create

a public fund, which, appropriately secured, would relieve the town from an immense burden in its taxation; or its proceeds, invested for educational or beneficent objects, would diffuse unmeasured blessings among the people.

Mr. Johnson remarked to me that he recollected when the whole district from Brushville to the present Hicksville, a distance of about twelve miles, was an open common, but which now embraces some of the best grass farms in Queens county. Occasionally the plains are penetrated from the sides by farms which show long cultivation, and date their occupation, by some squatter or pre-emptive rights, to a period anterior to the Revolution. These are generally valuable tracts. The original extent of the common lands has also been much reduced by modern encroachments of those who occupy contiguous lands. Farms which formerly contained fifty and sixty acres have grown by this process until now many of them contain from one to two hundred acres.

It will be recollected that Cobbett occupied a farm on the north borders of Hempstead plains. The first year, he states, he had no manure except four hundred bushels he swept together, on the land, by means of a broom. He applied to the land sixty bushels of this quality of manure to the acre, for a crop of ruta бага, and realized that season, a harvest of six hundred and forty bushels of the ruta бага to the acre. After referring to these results, to the caution he received against deep plowing, and giving a description of the soil, he uses this forcible language: "and yet people are flocking to the western countries in pursuit of rich land, while thousands of acres of such land as I occupy are lying waste on Long Island, within three hours' drive of the all-consuming and incessantly increasing city of New York."

THE BUSH PLAINS.—Proceeding east from the Hempstead plains, we enter near Farmingdale another territory, and as strange as is the aspect of the Hempstead prairie, this new scene is still more novel and impressive. This is the woodland or Bush plains of the island, and more familiarly designated the "Long Island barrens." The ground is chiefly occupied for a number of miles by a thick growth of low shrubby bushes, then succeeds a tract covered by small oaks, pine, and a heavy burthen of what is here called scrub oaks, but it is not the tree generally known by that name. This shrub is laden by a copious crop of acorns, which formerly, it is said, attracted the bear as well as the deer to these wilds. The entire surface, through these plains, is clothed in a heavy mantle of rank and coarse vegetation. The primitive forests, which consisted mainly of oaks, chestnuts and pines, have long since disappeared, although their former presence is indicated here and there by decaying stumps. I was informed that these lands, when they escape the ravages of fire, yield from the timber that now occupies them, a product of fire-wood once in fifteen or twenty years.

The strangeness and wild aspect of the scenery is beautiful and impressive, and the mind can scarcely comprehend the fact that such utter stillness and seclusion and *such* an exhibition of nature, in more than its primeval rudeness, should occur within three hours' ride of the great metropo-

lis. Almost as far as the vision reaches, the eye rests only upon a sea of waving bushes. They are not sparse and open, as is the case usually on feeble sandy soils, but the growth is heavy, compact, and generally uniform. Occasionally, patches of trees of a larger growth appear, but there is mainly a singular uniformity of shrubs and bushes, interlaced with vines and matted by a coarse herbage.

This rude wilderness extends from Farmingdale to Riverhead, a distance of about forty-three miles, and from the base of the ridge on the north to a narrow belt of beautiful and richly cultivated country which borders the sea coast. The tract is from six to eight miles wide, from north to south. When the Long Island railroad was constructed, about twenty years ago, it penetrated an unbroken wilderness almost the entire length from Farmingdale to Riverhead, in which appeared no dwelling, no culture, and no evidences of civilization except an occasional path which traversed the island from north to south, connecting the two opposite shores. The surface of this immense plain is so nearly level, with only trifling undulations, that the eye can detect no declension. From the ridge to the ocean, there is a gradual but imperceptible descent. The small streams, which generally start four or five miles from the sea coast, in their early course crawl sluggishly through the rank herbage which springs from their ooze, but in their progress they acquire more activity, until as they approach the ocean they become bright and sparkling brooks, with a current sufficient to propel machinery. These rivulets afford the choicest trout, and the plains furnish excellent sport in deer, smaller animals and fowl. Mr. Harold remarks in his memoranda, that the prairie hen (*Tetrao eupido*), was formerly abundant, especially in the bushy plains, although believed to be nearly extinct; during the last year they have again appeared. The Hempstead plains are animate with the presence of numerous birds. Large flocks of the bunting (*Emberiza savanna*), are found during the whole summer. The White Snow bird (*Plectophanes nivalis*), fatten upon the ripened seeds in autumn. He mentions several varieties of the plover and duck, and I saw the lark (*Alauda alpestris*), early in December, soaring with joyous wing from the open plains.

Within a few years a new epoch seems to have opened upon the scene, and the footprints of progress have been impressed on these lands. The plains are now not entirely without improvement, as numerous sites have been subdued and occupied. Productive farms and highly cultivated gardens and orchards, are springing into existence and beam amid these wilds like oasis in the desert. Some of these improvements already compare favorably in culture and productiveness with the most fertile tracts on the island. Men who unite practical knowledge to wealth and science have entered on these wastes, and are exhibiting demonstrative evidence of the capabilities of this soil for high and remunerative culture.

I have, in the preceding pages, attempted to present a rapid view of the existing aspect and condition of the territory which has so long, and with so much success, been denounced as "the barrens of Long Island." The

question naturally arises, why so extraordinary a state of things exist, and whether there is any fiat of nature that irrevocably condemns this vast tract to perpetual desolation and uselessness. Everything associated with the physical qualities of this beautiful island seems peculiar and striking, and unlike the characteristics of any other region. The existence of this uncultivated wilderness, is not the least singular and impressive of these phenomena. It is perhaps unnecessary to attempt an explanation of this strange circumstance. I may, however, offer one brief suggestion. At the first occupation of the island the settlers naturally clustered about the harbors and bays on the coast. Public roads, in consequence, were constructed along or near the north and south shore. None penetrated this tract. This was inaccessible while other sections of the island presented greater attractions and were easily accessible. The inhabitants became attached to the delightful regions they cultivated. In the meanwhile fires desolated the plains, because they were not protected, as it appears the occupied portions of the island were, by statutory regulations, from this danger. They were disregarded and neglected. Under these circumstances the opinion was gradually formed, that they were not adapted for cultivation. This idea was adopted without investigation, was strengthened by years, descended from father to son, until it has become incorporated in the popular mind as an established and incontrovertible fact.

It is my design to briefly examine the accuracy and justice of these opinions and to exhibit a series of facts which will tend, I think, to illustrate the subject.

THE SOIL.—No term applied to land was ever more erroneously used than the designation of the plains of Long Island as "Sand barrens." Neither term is either true or appropriate. A traveler passing along the line of the Long Island railroad will be deceived as to the character of the soil. The under stratum of coarse gravel has necessarily been cast up in the construction of the road, and this the casual observer will naturally suppose to be the soil of the country. I examined, with much care, various localities on the plains, and found everywhere a remarkable identity in the structure and qualities of the earth and a great similarity to that which occurs at Flatbush and Brooklyn. There prevails the same superficial loam, from one to three feet deep, then succeeds small gravel mingled with the loam, which rests upon the uniform foundation of coarse and rounded gravel. Clay is everywhere, on the plains, the predominant ingredient of the soil. I collected specimens in various spots, and for convenience moulded them into balls. When these had become hard, I could not separate the particles with my fingers, but was obliged to use a hammer for the purpose. The balls had acquired the consistency of a brick. I was shown by Doctor Peck, houses at North Islip, which had been constructed of sun dried brick, made from the soil in the immediate vicinity. The holes from which the earth had been taken for the purposes were pointed out to me. The excavations were on the loam or surface soil.

Mr. Harold informed me that walls were erected from the clayey soil of

Hempstead plains with lime made from oyster shells. Sands possess none of these adhesive qualities, and no intelligent person, after the slightest inspection would mistake the soil of the plains for sand, or would hesitate, even without the light of science, to pronounce it a clayey loam. It is nothing else, and the many square miles of plains which I explored possess this special quality, and exhibited, uniformly, a great preponderance of clay.

The soil of the Bush plains is yellow, tinged a little with red. That of Hempstead plains is darker, owing in some degree to the humus it contains, but essentially, I think, to the influence of air and heat, by which, on account of the absence of trees and bushes, it is more affected than the bush plains. I do not, of course, mean to assert, that there exists through the entire extent of this vast area, a perfect uniformity in the depth and qualities of the soil. No greater diversity, however, occurs than prevails in every equal extent of territory. There is exhibited on the plains, an occasional cropping out of the gravel stratum, and in places the loam has been washed off. Upon other level tracts, ravines contain the richest earth, but here, in conformity to the uniform dissimilitude to other districts, which prevails, the greatest thinness and barrenness of soil occurs in the depressions, while the best and heaviest land is found on the elevated parts of the plain. The loam presents a thicker stratum near the ridge, and it gradually loses this aspect as the plains approach the ocean. Ravines running north and south traverse, at intervals, the plains, and these, uniformly, have the lightest and thinnest soil.

In the fall of 1859, a long tract of land had been turned up in the construction of a road near North Islip station. I examined it with care and interest, and I never, any where, have seen a more beautiful development of soil. Mr. Bridger assured me, that from ample experiments, he considered the second stratum, or the mixture of loam and gravel I have described, quite as productive as the superficial loam, and Mr. Harold informed me that they considered it at Hempstead, preferable for corn in a cold season. Dr. Peek and Mr. Johnson both stated that they esteemed this soil the most congenial to the peach tree. Wherever this stratum had been thrown up and exposed to the air and sun, I saw white clover growing upon it in perfect luxuriance. The fertility of this substratum may be imputed, I conjecture, to the fertilizing soils and other ingredients which it receives from the superficial soil.

I cannot be mistaken, I think, in these views of the qualities and ingredients of this soil. I have not been able to subject it to analysis, but I am informed that specimens of it were submitted to the late distinguished Prof. Norton, who pronounced the soil deficient in no element of fertility, except a sufficient presence of lime and alkali. I learn, also, that Prof. Renwick, before the Institute, concurred in these views. Such is the judgment and voice of science on the subject. If the soil, by its elements, is adapted to cultivation, what possible other great and tangible impediments exist to exclude this immense territory from the labors and interests

of Agriculture? I will now proceed to present my own conclusions on this subject, in connection with notices of the objections which are urged against the culture of these plains.

Is the soil adapted to cultivation? The production, upon the plain lands, every fifteen or twenty years of a heavy burthen of firewood, and which sustains at the same time a massive growth of coarse herbage and under bushes, so thick as in places to be almost as impenetrable as a Mexican chapparal, would seem to conclusively attest the presence of a strong, as well as quick soil. Every opening on the plains reveals a vigorous growth of clover and other nutritious grasses, which spring spontaneously.

The demonstration afforded by practical results furnish the strongest evidence on the subject, and I will present a few instances in the actual cultivation of these lands, from the mass of facts which I have collected to illustrate the capacity of this soil for tillage. The soil of Flatbush and the range of farms upon the south shore, which have been cultivated for two centuries, and during that period have been esteemed the garden of the State, and which are still distinguished for the exuberance and beauty of their crops, exhibit the same elements of soil as the plains, and have the same appearance, modified by culture and the application of manures. If the land in these districts is susceptible of this high culture, and are made equally productive with the choicest land in the State, we are justified in the conclusion that soil in other sections of the Island, possessing the same inherent qualities, may, by similar culture, be made alike valuable for agricultural purposes. If, as I confidently assume the fact to be, the soil of Hempstead and the Woodland plains has the same normal properties as that of the other localities referred to, there can exist no reason why they cannot receive the same productive improvement.

We are not left, however, to mere conjecture and speculation on this question. Practical results accumulate abundant testimony to the capabilities of these lands for high and remunerative culture. The long succession of farms which have been carved from the plains in North Hempstead at a comparatively recent period reveal a high state of improvement. The lands near Hempstead village, which have been absorbed by the process of encroachment I have mentioned, are now, I am assured, in as great fertility as the portions of the same farms which for generations have been cultivated. Mr. Harold informs me that records exist of harvests of winter wheat on plain lands of thirty-four bushels to the acre, weighing sixty-two pounds to the bushel, and from sixty to eighty bushels of shelled corn to the acre. I saw myself in December, 1859, specimens of spring wheat raised by Mr. Sammis on Hempstead plains, with an interval of only three and a half months between sowing and harvesting, which yielded twenty-three bushels to the acre. Mr. John A. Bedell received a premium from the Queens County Society, and in competition with some of the choicest farms on Long Island, for a crop of oats from one acre, two roods and eighteen rods, measuring seventy-eight and one-fourth bushels and weighing 36 pounds per bushel. This crop was also raised on plain land in the same year. It yielded

a net profit of \$26.62. No extraordinary expenditure produced this result. The farm of the late Mr. Charles Wilson, at Deerpark upon the Bush plains, thirty-seven miles from Brooklyn, furnishes the strongest evidence of the capacity of these plains for agricultural purposes. My notes of a visit to this farm in the summer of 1857, contain the following comments: "Mr. Wilson commenced his operations in the heart of this waste about five years ago, and has at present about eighty acres under cultivation. His place is in the midst of and is enveloped by the woodland "barrens." His crops are now as beautiful and luxuriant as bask beneath any sun. He has an extensive grapery, flourishing young fruit trees, and a delightful garden. He pointed out to me a large and flourishing corn crop, standing upon ground which last February was covered by a dense mass of scrub oaks and rank herbage. These were cut off, the land plowed, the roots picked up and converted into a fence, which separates the field from the adjoining waste, now not more rude and desolate than was the flourishing field six months ago. The original price of this entire property was \$5.00 per acre; the expense of preparing this particular lot for tillage was about \$15.00 per acre, and I saw many acres which will yield a profit beyond all disbursement, that will make the land worth to him, as an investment, at least \$200 per acre. The expense incurred, in clearing this corn-field, by Mr. Wilson was much heavier than is necessary, where economy is an object. This gentleman assured me that his application of manure to this land was not greater than equivalent of fifteen loads of barn-yard manure to the acre. He expressed the decided opinion, which was concurred in by others who had experimented on the subject, that the effect of manure was as favorable and enduring upon this soil as on any other."

Two years later I saw this farm, and it afforded exhibition of continued improvement, in the hands of a son of the former proprietor. In the year 1858 Mr. Wilson raised a crop of 3000 bushels of potatoes from ten acres of land, which he sold for \$1,875. He expended per acre for manure \$50.00 and for cultivation \$37.50, making an aggregate \$875.00, and leaving a net profit of \$1,000. The same lot yielded a heavy crop of wheat last season, and now presents as beautiful a clover ley as ever excited a farmer's admiration. A piece of land, several miles east of Deerpark upon the plains, owned by Mr. S. Taylor, and embracing two and three-fourths acres, yielded, in 1858, seven tons of good hay, and a still heavier crop the last year. This land, I learn, had received no application of manure in the five preceding years.

A highly eminent gentleman who resides on the Island a portion of each year, informs me that it is habitual for the occupants of the gardens and orchards on the south shore, to transport the loam from the plains to replenish and fertilize their grounds. If this soil is worth transporting for such purposes, it can require no elaborate argument to prove its value for cultivation.

It is not necessary to pursue these illustrations. The facts I have ad-
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duced are sufficient to establish the qualities of these lands. In objecting to the evidences of these results, it is sometimes urged, that these crops were raised in peculiar and favored localities, which are exceptions to the general character of the soil. The error of this position will be most apparent to any one who will make the proper investigation. These localities will be found in no respect superior to the average of plain lands and precisely similar to the soil of the wilds, which is only separated from them by a simple fence. I will now briefly notice some of the objections which are advanced to the culture of these lands. I have already incidentally discussed some of the most prominent.

OBJECTIONS TO THEIR CULTURE.—One of the most prevalent objections which is often urged, rests on the idea that the porosity of this soil renders it too dry for cultivation and incapacitates it for the retention of manure. The instances I have already introduced, such as the heavy crop of grass upon the land of Mr. Taylor, with no application of any manure for the five preceding years, seems, by practical results, to disprove this theory. I have not space to discuss the question so much controverted, whether manure is wasted by evaporation or leaching, but will assert without hesitation, that a soil made so adhesive by a preponderance of clay, as characterizes the plain lands, is in danger of being too compact rather than too open. A superficial soil of this kind, from twenty inches to three feet in depth, can scarcely suffer from porosity, and that it does not, is evident from the heavy crops of grain and grass it yields, and the luxuriant growth of fruit trees on the improved spots, as well as the immense burthen of forest trees and vegetation it bears in its native condition. I believe that the under stratum of coarse gravel which must cause this porosity, if it exists, has no greater effect upon the superficial soil than would be produced on any earth by a thorough system of under-draining. It is this agency that carries off the surface water and renders the soil dry and warm. That the influence of this formation is useful and its effects similar to that of under-draining, appears from the fact mentioned by Mr. Bridger, that on removing the earth with a hoe, in the dryest weather, he always found moisture beneath. He stated that his crops never suffered from the drought. This moisture is doubtless the effect of capillary attraction, which, it is contended, is an agency that causes one of the peculiar benefits secured by under-drainage.

SOURNESS.—There is, I believe, little difference of opinion in reference to the fact, that the bush plains are affected by an innate acidity which imparts a certain degree of coldness and infertility to the land in its natural state. It is not greater, however, than might exist in any earths which have been shrouded for ages from the influence of the sun and air, by a heavy foliage, where leaves accumulate in deposit on the surface and are in various processes of decomposition. The application of alkalis, or quickening manures and the effect of cultivation alone, rapidly relieve the soil from this property. When it is turned up to the action of the sun and feels the influence of the elements, this acidity soon disappears. This re-

sult is apparent from the circumstance, of which I am amply assured, that these plain lands improve constantly in their fertility under cultivation, even when no manures are applied.

FROSTINESS.—The alleged tendency to be affected by frosts, is another objection urged against the cultivation of the plain lands. It seems impossible to my mind in the nature of things, that any district of an Island, in the position of Long Island, and so remarkable for its mild temperature, should necessarily be exposed to this great evil. If frosts do at present prevail on these plains, the fact may be referred to philosophical causes, which the progress of improvement will remove. Here is a vast area covered by a thick matting of trees, bushes and impervious herbage. The winds do not circulate through this canopy; the earth beneath it is always damp—an immense excess of evaporation takes place from these combined causes, and the soil has never been penetrated or warmed by the genial rays of the sun. Gentlemen remarked to me, that when riding through the plains in the evening they could perceive a difference of several degrees decrease in the temperature among the bushes and that of the atmosphere which enveloped the clearings. When this vegetation is removed from the surface and the earth is dried and warmed by the action of the air and heat, no difficulty of this kind, I am confident, will exist.

THE EXPENSE OF CLEARING.—The heavy expense which, by the common practice has been incurred, in preparing the lands of the bush plains for tillage, has been a serious obstacle to their occupation by men of ordinary means. The peculiar advantages of position and the great value of these lands when subdued, will probably justify these disbursements when the occupant possesses capital which he can conveniently appropriate to the purpose. The soil is thus brought into immediate culture and productiveness, and one successful crop will generally return the expenditure. The method used upon these lands ordinarily is very unlike that pursued with other wild lands. The usual course elsewhere, is to cut the heavy timber, to clear off, pile and burn the under-brush and rubbish; to seed down with a crop dragged in on the fallow, and leave the roots and stumps to decay through the processes of Nature. When this is accomplished, the plow is successfully introduced. There is delay in this system, not perhaps conformable to the designs and interests of the proprietors of the plain lands, but by it great economy is secured. No owner of wild land in other sections of the country, would dream of preparing his soil for cultivation by a preparatory grubbing by manual labor; yet, under existing circumstances, this method on these plains, has undoubtedly its advantages.

I have carefully collected information in reference to the various plans pursued in these operations, and will briefly present the result of my enquiries. Mr. Bridges has favored me with a very intelligent account of the methods he has used in subduing his own lands. I can merely introduce an abstract of his paper. He states that he has tried three methods: 1st. Grubbing all over by hand, taking out everything, stumps and bushes. 2d. What we call stumping, which is to go over the land cutting the stumps 6 or 8 inches below

the surface, then plowing with two horses and dragging." 3d. "Plow with a horse and yoke of oxen and heavy plow, then follow with a drag, collect the roots and burn them." In each of these methods I infer the bushes are to be cut and burnt or removed. The first course, he thinks, should only be adopted on a small scale, as the process is slow and expensive. The second is effective, but also requires much more disbursement than the last. The plowing in the third method may easily be performed by a span of horses and one yoke of oxen. Mr. Wilson, in a careful account, made the expense of grubbing his lands, and the work seemed to be admirably executed, at \$15 per acre. Mr. Bridger calculates it at a much higher rate. It is very manifest that these lands should be cleared at an expenditure much reduced below these figures.

Dr. Peck, who has had long and familiar practical acquaintance with the management of these lands, both in their rude and cultivated state, proposes several methods which he has himself pursued, and which, if practicable, reduces the process of clearing to a very simple and economical operation. It is proper to remark in connection with this subject, that the wide spreading and massy roots of large trees which usually occur on other new lands and so inconveniently impede the plow and drag, do not now exist on these plains. The large roots of the oaks, which do not however, attain a great size, are chiefly tap roots, penetrating the ground vertically, and not widely extending over the surface. The roots of the shrub oaks and bushes, are soft and porous, readily severed by a sharp coulter, and rapidly decay in the earth when their vitality is destroyed. Another great facility to the plowing of these lands, even while filled with roots, is the absence of all rocks and stones. These facts afford the basis of the system recommended by Dr. Peck. One of the plans he suggests, is to cut down the under-brush by a heavy scythe or bush hook after the timber is removed; burn this with all the rubbish upon the surface. When the ground is cleared of these impediments, enter on it with a stout, heavy plow, prepared with a sharp steel coulter, and a cutter attached to the point and drawn by two yoke of cattle. With this force, he thinks everything can be plowed up and turned under, except the few larger stumps, and these he would leave for time to effect their decomposition. This course would bring the land into immediate cultivation, but of course not into the beautiful condition careful grubbing would accomplish.

Another method Dr. Peck proposes is still more economical, but more tardy in its results. Here he would simply cut and burn the underbrush, remove the rubbish, and drag in a crop of rye with clover and timothy seed. The bushes and the grain and grass will start together in the spring, but the rye will ultimately attain the ascendancy. He cuts the rye at harvest with a short straw. The crop will be small, but aids in remunerating the labor. In August he cuts closely the young sprouts, which are as tender at that season as corn stalks, with the grass. The mass affords good coarse sheep fodder. Repeat for two or three years the operation, cutting the bushes two or three times each season, when they will be

entirely destroyed. The roots will have, to a great extent, decomposed in the earth, and in the process have imparted, he thinks a fertilizing element to the soil equivalent to fifteen or twenty loads of barn-yard manure. Dr. Peck objects to the grubbing system, for the reason that by the removing of the roots, it deprives the soil of this great fertilizing principle. I have no doubt but that a vast aggregate of vegetable matter may, by deep plowing, without grubbing, be incorporated with the soil. I do not merely embrace in this idea the spongy roots referred to, but the leaves and the coarse vegetation which shroud the surface by a net work of its infinitude of roots, fibers, and tissues. To what extent these materials would be disturbed by the harrow, and clog its operations, I have no practical knowledge; but I conjecture that the collecting and burning of those which should be brought to the surface, would not be attended with much expense. The earth on the third or fourth year, in the second method advised by Dr. Peck, would be ready for plowing. The large stumps will then be torn up by the plow without difficulty. He thinks that seven or eight dollars will cover the disbursement of clearing the land by either system. The burning over the whole surface is in one aspect objectionable. The accumulation of vegetable matter, and the humus on the soil, will be consumed by the process. Although the ashes will be valuable, the ingredients themselves are far more so. I should prefer, I think, piling the bushes and rubbish in as narrow and high heaps as possible for burning.

In my judgment, when the land is not designed for immediate cultivation, sheep would be found the most effective and economical agents for preparing the soil for tillage. The course to be pursued in this system would be to cut off the trees and large bushes, pile and burn the refuse material, and enclose a field, its size being determined by the number of sheep, by a secure fence. Turn into this enclosure the flock of sheep, in early spring, when the young sprouts begin to start, and the coarse grasses are tender and juicy. Sheep delight in this kind of pasture. They feed with avidity upon these grasses at that time, and will totally suppress the growth of all bushes and briars. In the second year the surface of the land will be cleared and subdued; and while this process is in progress, the roots and stumps will have essentially decayed. In addition to these benefits to the land, the sheep will impart a positive and great fertility to the soil, which will be equal in its effects, to the application of a large amount of manure. Their excrement must also exert a powerful effect in freeing the soil from its inherent acidity and inertness. The entire surface of the land will, in two years, be mantled by a rich and verdant covering of clover. When I suggested this mode of reclaiming these lands, I was met by the objection that on the Island sheep cannot be protected from the ravages of dogs. In my journeying on the Island, I noticed only one flock of this valuable animal, and their absence was imputed to this cause. The enforcement of existing statutes, or of more stringent laws, if required, might certainly remove this impediment to the fostering of a most important branch of stock husbandry.

CULTIVATION.—The method by which the most judicious and appropriate culture may be applied to these lands, is a question of the greatest practical importance. The fact, I think, is established, that they possess most of the essential inherent properties necessary to successful tillage. They are of sufficient natural fertility; they are warm, genial and perfectly underdrained. The abundant crops they yield, afford the most conclusive attestation of the correctness of this opinion. It is undoubtedly true that they require, or like most other lands are greatly benefited by the application of manures; but it is not true that an excessive quantity is necessary to render them productive, or that the effect of manure is not enduring. Land which, for a series of years, will yield an unusually large burden of hay, without the use of stimulating ingredients, must be esteemed congenial to grass. Soil which returns an abundant crop from the moderate application of manure, as was illustrated in the corn and potato crops on Mr. Wilson's farm, will amply remunerate a large disbursement for that purpose. I saw a heavy corn stubble in the autumn of 1859, on the land of Mr. Bridger, which indicated a most vigorous crop, that he assured me was raised with no other manure than a little poudrette in the hills. The fact is not controverted that the plain land, when first cultivated, requires a small application of manure to correct its natural sourness and inertness, and to stimulate it into activity. The soil feels the influence, and amply returns the expenditure. The remarkable crops I saw upon the plains were, in no instance, secured by an extravagant outlay for fertilizers, and no greater than every provident farmer would desire to effect a remunerative result to his labors. Fifteen loads of barn-yard manure to the acre, seems to be regarded as an abundant application.

The clover culture I regard to be the instrumentality which is calculated the most certainly to advance the agricultural prosperity of this territory. The soil is adapted to it; and the mild climate, frequent rains, and moist atmosphere, will always maintain the crop in a vigorous and thriving condition. I have seen nowhere, more beautiful and prosperous clover crops than I met with on these plains. The same natural causes will cherish the culture of other grasses. Gentlemen assured me that the wild grasses on Hempstead Plains, are as enduring as any other grasses, and retained, throughout the summer, their freshness and nutrition.

A rotation of crops, based on the clover culture, is, I have no doubt, the most certain system by which the permanent improvement of the soil may be effected. The exemption of the land from stones and large stumps, the ease with which it can be tilled, the mildness of the climate, and the additional time this circumstance affords for labor, are all highly important inducements for the cultivation of these lands, and should be considered in deciding upon a system of tillage. I am confident that their successful cultivation does not necessarily demand any extraordinary investment of capital or extravagant disbursement for fertilizers, but that this result may be attained by common means, guided by a judicious and intelligent husbandry.

Dr. Peck, Mr. Bridger and other gentlemen, have supplied me with much valuable information in reference to the practical management of these lands, which seems to be combined in the following conclusions. Rye or buckwheat, in a fair yield, can be relied on upon the new land without manure. Mr. Bridger remarks: "sow with buckwheat, with a dressing of one hundred and twenty-five pounds of Peruvian guano, or twenty bushels of shell lime, or ten to twenty bushels of bone chips; plow the crop under; sow again, if practicable, with buckwheat if not with rye; seed with clover, plow under one good sward of that, and you are all right." "Corn, potatoes, or indeed any crop may be obtained by using three or four hundred pounds of Peruvian Guano, at three cents per lb., or five hundred pounds fish guano, at one and a half cents, or fifteen thousand fish, at \$1 per M. To produce hoed crops successfully, some stimulating manure is necessary. The best I have tried is, first, barn-yard manure; next, bone dust, lime, salt and ashes mixed together, are good; gypsum also succeeds, although science may condemn it in a marine atmosphere. Clover, however, will be the great agency in bringing the land into good condition, and that can be produced here equal to any section of the country.

GARDENS AND ORCHARDS.—The course of discussion which I have pursued has led me to examine the plains in reference chiefly to their capabilities for agricultural purposes. A still more desirable and lucrative occupation of this land, will be found in its appropriation for gardens, orchards, and the smaller fruits. A warm and quick soil, a genial climate and moist atmosphere, combine to eminently adapt Long Island to these pursuits. The plains are no exception to this remark. Two years ago I visited a peach orchard in the vicinity of North Islip Station, then just planted. In the season of 1858, it yielded an abundant harvest of the choicest fruit, and the orchard now exhibits a healthy and vigorous growth that can nowhere be excelled. Numerous other experiments with the peach, pear, cherry, apple and plum, have met with equally successful results. I saw young apple trees on the grounds of Mr. Bridger which bore the second year from the nursery. These, and trees of other fruits, disclosed a heavy growth of twenty inches to three feet, last season.

The blackberry, raspberry, and other small fruits, flourish on this soil in a vigorous and luxuriant growth. The strawberry is equally prolific and successful. The culture of the low or swamp cranberry, is a novel but highly interesting feature in the horticultural industry of the Island. The experiment of Mr. Young and its eminent success, has attracted much attention to this subject, and there is every indication that this culture will be widely extended and become a lucrative pursuit. The ground occupied by Mr. Young for this purpose, is at Lakeland, in the central part of the Bush plains. The cranberries he cultivates, are procured with trifling expense along the margins of the swamps in the vicinity where they grow spontaneously, and in great profusion. He planted in the year 1856, about one-third of an acre of plain land to the cranberry, and in the autumn of

1859, he received from the American Institute, a premium on about twenty-four bushels of beautiful fruit picked from these vines. He has other pieces of the cranberry quite as promising as this, under cultivation. Mr. Young, in his statement to the Institute, says, as the results of his experience, that "the cranberries will grow and do well, although the vines be taken directly from the swamps; that they will grow on new land and immediately on its being broken up; without manure; without a wet sub-soil; without artificial irrigation; with but a moderate amount of labor; producing a good sized, deep colored, well matured and high flavored berry, and that in dollars and cents, the returns are sufficient to induce many to follow the example set before them."

I regret that the limits of this paper will not permit me to explain the method pursued in the cultivation of this valuable plant, or to urge the various reasons which suggest themselves for an extended appropriation of these lands to the object. I found a number of individuals preparing with much zeal, to embark in the business the next year.

Numerous gardens are scattered near the line of the Railroad through the whole length of the Bush plains. Fragrant with flowers and exhibiting a growth of vegetables of great size and rare excellence, they are eminently suggestive of the results which may be attained when horticulture shall receive the attention and enlarged operations its great importance will warrant. The beautiful grounds and decided success of the efforts of Mr. Ranney and Mrs. Landon, near Thompson's Station, and of various other individuals in different localities, enforce this conviction.

The gardens of the Messrs. Van Sicklen, south of the Railroad in Jamaica, illustrate the great profit of this occupation in connection with these lands, when it is conducted on a liberal and capacious plan. These gentlemen occupy about one hundred and sixty acres of land, not superior in quality to the average of the plain lands, and which is chiefly devoted to the culture of vegetables and other garden products. They expend annually \$3,000 worth of manure, principally stable dung, and realize upon their grounds an average neat profit each year, of about \$6,000, from the proceeds of the crops they produce.

When improvement and cultivation shall have succeeded the rude wilderness which now deforms these plains, the repose and seclusion, the delightful climate, the salubrious air, and the exceeding beauty which will then fascinate the eye, will allure to this region, the votary of Nature, and the men of business and wealth. A dwelling upon these plains will then gratify the taste, and secure all those pleasures and enjoyments which render a rural life so attractive to the denizens of the city. A small freehold may now be purchased on this territory at a price which would scarcely secure a rocky knoll at the same distance from New York, on the banks of the Hudson. The region surrounding Lake Ronkomkama, a beautifully picturesque and romantic sheet of water, will afford the most delightful country residence that wealth or taste can desire.

A design of Mr. Stone, of Brooklyn, which I trust will be consummated

the ensuing spring, foreshadows a policy calculated to effect results of great public as well as private utility. The purpose is to form extensive manufacturing establishments upon this territory, and to confer on the operatives the privilege of purchasing small parcels of land, at moderate rates, for their own cultivation. Steam will always readily and cheaply supply the motive power to any extent, for such institutions. I can only thus glance at the scheme, but its importance to individuals and the immense augmentation of the business and wealth of the Island it would promote, must commend it to the earnest consideration of every intelligent mind.

I have, in the preceding pages traced, with a rapid hand, the views I have embraced, after a careful examination of these plains in their various aspects, and all the reflection I have been able to give to the subject. In revolving the different topics I have discussed in my own mind, and comparing these views with the opinions of intelligent and practical men who are familiar with the question, I can discern no cause to doubt the general justness and accuracy of my conclusions.

Possibly, my judgment may be influenced by an undue enthusiasm, but my imagination, penetrating the vista of a few approaching years, perceives culture and beauty succeeding the desolation that now mars and disfigures the scene and revolts the eye; I see a vast champaign, unsurpassed in beauty and luxuriance, spreading over an area of sixty miles in length, adorned by the villa and cottage, redolent with the golden harvest, embellished by gardens and orchards, teeming with flocks and herds, and animated by the clangor of machinery and the pulsations of industry. When this fancy shall, as it must, have acquired the tangible form of the actuality, there will be revealed in this territory to the delighted vision, a scene of beauty, of rural wealth and attractiveness, that will be surpassed in no section of our land.

COUNTY ASSOCIATIONS.

From the reports of the county societies abstracts are given which show a continued improvement. In many of the counties the exhibitions have been of a most gratifying character, and indicate a steady and healthy progress in the various departments of agriculture. The most satisfactory evidence is afforded that increased attention is given to the various improvement which are in progress in our State. Draining, which but a few years since was practiced only in particular localities, is now receiving attention from practical farmers in almost every county, and it is very gratifying to learn that the most encouraging and satisfactory results are derived from this practice.

In preparing the reports for the Transactions, we have endeavored to give the most important matters that have been returned. From several counties no returns have been received other than the award of premiums, and a statement of receipts and expenditures; these have been omitted, as being of no general interest, and as affording no evidence of the real state of the agriculture of the county from which the report is presented.

It is hoped that the societies will hereafter be more careful in the preparation of their reports, and will furnish evidence of the present condition of their agriculture in their respective counties. The subject of statistical returns has been presented to the officers of the societies, and if systematically attended to by the county and town organizations, would, in a few years, afford much valuable information, of great practical value to the farmers of our State. We would call attention to this subject at this time, as it is contemplated to offer premiums for the best statistical reports from county and town societies, and should this be done, we trust there will not be a society in the State but what will give attention to it. Should this be done, a mass of facts would be presented which would contribute much to the best interests of agriculture in every section of our State.

The census is to be taken during the year, and an excellent opportunity will be afforded to commence a systematic effort in each county. Should this be undertaken with a proper spirit, we have no doubt that the efforts of a single year will be of such a character as to make its permanency unquestioned, and hereafter it will not be necessary to direct the attention of the societies to it.

OFFICERS COUNTY AGRICULTURAL SOCIETIES, 1860.

NAME OF SOCIETY.	PRESIDENT.	SECRETARY.	TREASURER.
Albany	Wm. Hurst.....	J. C. Cuyler	H. L. Emery.
Alleghany.....	Albert Brown.....	E. M. Alba	James Lockhart.
Broome.....	Oliver C. Crocker	W. S. Peck.....	Robert S. Osborn.
Cattaraugus..	N. Walker.....	John Manly.....	H. S. Huntley.
Cayuga.....	Wm. Webster.....	Benj. B. Snow	L. C. Mann.
Chautauqua ..	A. F. Allen.....	Sidney Jones.....	S. S. Cady.
Chemung.....	A. J. Wynkoop.....	B. S. Carpenter	J. T. Arnot.
Chenango.....	Horace Parker	Jonathan Wells	Jonathan Wells.
Clinton.....	P. G. Elsworth.....	Wm. H. Bailey.....	R. O. Barber.
Columbia.....	John T. Hogeboom	Abram Ashley, Jr.....	James T. Shufelt.
Cortland.....	W. P. Randall.....	A. D. Blodget.....	Morgan L. Webb.
Delaware.....	S. F. Miller.....	Z. H. Sloat	Hiram Olmstead.
Dutchess.....	James Haviland	George Sweet	John G. Halstead.
Erie.....	W. Hambleton	Elias Webster.....	Geo. W. Scott.
Essex.....	A. B. Mack.....	A. L. Finney.....	C. N. Williams.
Franklin.....	A. Lindsey.....	Smith T. Palmer.....	D. N. Huntington.
Fulton.....	Elisha Briggs.....	Isaiah Yauncy.....	Charles Prindle.
Genesee.....	C. K. Ward.....	N. R. Cone.....	H. Bostwick.
Greene.....	A. P. Jones.....	H. L. Day.....	D. K. Olney.
Hamilton.....	Richard Peck.....	Joseph W. Fish.....	Isaiah Morrison.
Herkimer.....	John A. Rasback.....	Duane Richardson	William E. Lewis.
Jefferson.....	Wm. Rouse.....	A. P. Sigourney.....	E. S. Lansing.
Lewis.....	J. S. Jackson.....	F. B. Morse.....	A. H. Lee.
Livingston.....	A. Bradner.....	Henry V. Colt.....	E. R. Hammett.
Madison.....	D. B. Shapley.....	L. B. Kerr.....	T. F. Petrie.
Monroe.....	D. D. T. Moore.....	Samuel Miller.....	M. C. Mordoff.
Montgomery..	Jesse De Graff.....	Abner H. Burtch.....	Richard H. Cushney.
Niagara.....	F. Spalding.....	P. D. Walter.....	E. A. Holt.
Oneida.....	N. S. Wright.....	R. N. Morrison.....	S. R. Greenman.
Onondaga.....	James M. Munro	Hiram Wiard	E. P. Hopkins.
Ontario.....	Wm. S. Clark.....	Gideon Granger.....	George Gorham.
Orange.....	Wm. H. Houston	H. Morrison.....	A. L. Beyea.
Orleans.....	D. N. Hatch.....	A. R. Patterson	John H. White.
Oswego.....	Joel Turrill *.....	D. Farling.....	S. G. Merriam.
do (Mexico) ..	T. H. Austin.....	E. Midlam.....	L. H. Conklin.
Otsego.....	Alfred Clarke.....	C. J. Stillman.....	G. Pomeroy Keese.
Pntnam.....	C. R. Weeks.....	L. M. Belden.....	Saxton Smith.
Queens.....	E. A. Lawrence.....	John Harold.....	John Harold.
Rensselaer....	Geo. Vail.....	J. C. Markham.....	H. W. Knickerbocker.
Rockland.....	John W. Ferdon.....	A. E. Suffern.....	Peter T. Stephens.
St. Lawrence..	C. T. Hurlbud.....	L. E. B. Winslow.....	George C. Bogue.
Saratoga.....	Wm. Wilcox.....	F. S. Root.....	R. S. Burtis.
Schoharie.....	Henry L. Russell.....	Jeremiah Fox.....	Charles H. Shafer.
Schnyler.....	William Vaughn.....	S. W. Sacket.....	Thomas Evans.
Seneca.....	E. Munson.....	Charles Sentell.....	John S. Coe.
Stenben.....	John W. Taggart.....	Robert M. Lyon.....	Reuben Robie.
Snllivan.....	C. Hatch.....	J. E. Quinlan.....	James Williams.
Tioga.....	Wm. Ellis.....	Wm. Smith.....	T. J. Chatfield.
Tompkins.....	A. B. Burham.....	A. N. Huntington	O. B. Curran.
Ulster.....	C. L. Kiersted.....	B. B. Hoornbeck.....	John Chipp, Jr.
Warren.....	B. C. Butler.....	John Cromwell.....	W. W. Hicks.
Washington....	Freeman A. Fuller	E. H. Newton.....	Samuel W. Crosby.
Wayne.....	D. W. C. Van Slyke..	H. P. Knowles.....	Wm. D. Perrine.
Westchester..	Henry Keeler.....	John Cowan.....	James Armstrong.
Wyoming.....	John A. McElwaine....	A. W. Wood.....	T. H. Buxton.
Yates.....	Job L. Babcock.....	A. F. Stark.....	Benj. T. Hoyt.
Am. Institute	W. Hall.....	T. McElrath.....	

ALLEGANY.

The exhibition of atock and sheep much better than ever before. The county is well adapted to the growing of wool, and an increased interest is manifested in the improvement of sheep. The dairy was well represented; and vegetables unusually fine. The contributions of the ladies' department were unusually attractive.

* Judge Turrill, deceased.

BROOME.

The season past has been peculiarly a hard one for the farmers of this county. The serious frosts of May and June, and the early frosts in the fall, about ruined the corn, which may be considered a staple crop among us. In some localities the rye also was seriously affected. Hay probably not more than half a yield. Spring and winter wheat good. Oats unusually heavy. Barley but little grown. A very large breadth of land sowed to buckwheat, and the yield an average one.

Of dairy products. Butter is one of the chief staples of the county. Many packages were on exhibition, showing much skill and perfection in the manufacture. Cheese also of very excellent character was exhibited, but there is less competition than its importance demands.

The raising of blooded stock, particularly neat cattle, has been very much neglected. But since the organization of our society, more attention is being given to it. There was a spirited rivalry in all classes of horses, and many very excellent specimens were on exhibition. The society offered a premium for the best cultivated farm of not less than fifty acres in each town in the county. Reports received from seven of the towns and premiums awarded to Franklin Beach, town of Burke; Wiley Scott; Colesville; H. V. Waite; Port Crane; Wm. Smith, Triangle; Robert Hogg, Maine; Oliver C. Crocker, Union Center. (We hope this practice of farm premiums will be adopted in other counties. J.)

The annual address, by Hon. A. B. Dickinson, was replete with common sense and practical suggestions, and was listened to by a large and highly interested audience.

CATTARAUGUS.

The following report, on plows and farming implements, was commended by the managers as a good example of what a report should be. Mr. C. C. Rice from the committee, reports:

It is with much pleasure that we announce that an interest was taken in this department, and that it was superior to all former exhibitions of this class in this county. The numerous articles were of the very best design and workmanship; some were new and novel; and all showed, by their style of finish and perfect workmanship, that their exhibitors were not to be excelled by each other, or at any other exhibition in the country. The articles were numerous, and many of them had several competitors for the premiums offered by the society; and in fact all were worthy of public notice and patronage, if not premiums—for we saw not one article on exhibition in this department that was not commendable to our agricultural service.

First on our list were mowing machines, and of this class we are sorry to say but one was on exhibition, a model of about half size, from the well known establishment of Geo. Chamberlain, Olean. The machine was invented by him the past season; consequently he has not had opportunity

to test his invention. It is a rotary machine, the knives being so arranged as to come in contact with the grass after it is gathered into the fingers of the machine; they first gathering, and at the same moment the knives cutting, the fingers rotating one way while the knives revolve the other, making its work positive, and seemingly with but very little ado.

A very great variety of plows were on exhibition. They were all of the very best quality. The committee were much in favor and desired to do justice to all, and such was the degree of workmanship, skill and perfection displayed, that we were unable to discriminate between them as to their general utility, unless we saw them tested; consequently we decided to have a plowing match. Messrs. Eastman & Myrick, of Olean, manufacturers of the Doe plow, six different sizes, Sellew & Popple, of Gowanda, manufacturers of the Lockling plows, promptly responded. The plowing was spirited and lasted an hour or more, and as the other exhibitors did not appear, the performance closed. The committee would recommend to the board of managers that the Doe plow is worthy of the first premium, and that a further consideration be awarded to Messrs. Eastman & Myrick for their liberal contributions, showing much skill and workmanship, also a determination to introduce articles of the first class for the benefit of their county; and the Lockling plows the second premium. Also, a further consideration to Sellew & Popple for their numerous articles on exhibition. The other exhibitors of this article of husbandry showed much skill in their articles, but we could not say further, as they did not plow in competition with the Doe and Lockling plows.

The drags or harrows were only two in number. One, the Patent Revolving Harrow, quite novel in its appearance, and doubtless would be useful in some soils, was exhibited by Mr. Wing, of Franklinville. The other was manufactured by Messrs. Eastman & Myrick, of Olean, is of new origin. Bucklin's patent is highly recommended, and from the manner of construction we have no hesitancy in awarding it the first premium. A number of fanning mills were on exhibition and only two competitors; both kinds of mills were very fine in construction, and are worthy of high consideration, to which we award the first and second premiums.

Cultivators of the finest kinds and from different manufacturers, showed great skill in workmanship, and were a credit to their exhibitors. Messrs. Sellew and Popple, of Gowanda, had three different kinds, two of which were awarded the highest prizes.

Straw-cutters, now very much in use, of three different patents, all did their work with almost perfection, and but little difference; The awards were on two, and were decided according to merit.

Among the articles enumerated above, we found a highly finished cant-dog, made by Mr. R. T. King, of Olean, a mechanic of the first water. It is only adapted to harvesting a crop of logs after a heavy cutting of timber, and burn before planting corn, wheat, rye, &c., or rolling logs from banks of rivers; such is the use of the implement, and we would recommend it as worthy of notice. Finally the committee on class 22—agricultural im-

plements—have discharged their duties under considerable difficulty, and according to the best of their judgment; and although we do not expect to give satisfaction to every exhibitor, we have done our best.

After a full description of the manufactures on exhibition, and of miscellaneous articles, fruit, &c., the managers say :

The display of stock was most creditable—Devons, Durhams, and Ayrshire cattle; South Down, Merinoes, Leicestershire, and Cotswold sheep; Suffolk, Berkshire, and Chester swine; Messenger and Black-Hawk horses, rendered this department unusually large and attractive.

The Hon. Daniel S. Dickinson delivered the annual address. It embodied, in the best possible style, the true elements of political economy, and reduced success in life absolutely and entirely to the principle of cause and effect. Labor and economy, integrity and perseverance, appeared to be laid down by the distinguished gentleman as the means of success. He was listened to with wrapt attention by an immense audience. His style is lucid, his enunciation distinct. He evidently meant what he said, and said what he meant.

The fair demonstrates that Cattaraugus county possesses within herself, through her sons and daughters, elements of wealth and prosperity of a high character. Her capacity for productions from the soil, the skill of her artisans in manufactures, both of machinery and of woolen and other goods, her household manufactures, her dairies, are all of a high order—though but partially developed—and should not be neglected by her people. The generous rivalry sought to be kept alive by our county fairs, cannot but be wholesome in its operations. The publicity given to reliable productions invites attention from abroad, and induces purchasers to buy of our people the products of their own labor, thereby encouraging them to continued exertion. It is to be hoped that future fairs will call out still more the talent, skill, and enterprise of our county. With abundant water-power, and situated on the border of the richest depository of coal and iron ore of McKean county, and with timber enough to supply an almost unlimited amount of lumber, with unrivalled railroad and water facilities for transportation, with a climate proverbially healthy, our county is destined to be one of the wealthiest, and can be made the “empire county” of the Empire State.

CAYUGA.

Two fairs were held during the season—one for horses, the other the usual agricultural exhibition. The results of the exhibitions during the season were creditable, and it is hoped that efforts will be made to increase the interest of the farmers in the operations of the society. The annual address was delivered by Hon. John Stanton Gould, of Hudson. His subject was, “The Grasses,” and it was one of the most instructive and interesting addresses which has been delivered. The address was published by the society, and is one of the best on the subject of grasses and

their management that we have read; and it is hoped its circulation will be the means of directing the attention of the farmers to a subject too little understood—the management of grass lands.

CHAUTAUQUA.

The expectations of the farmers in the southern part of the county, where the fair was held, were blasted by June frosts, which affected the quantity and quality of grass for the season. The exhibition of stock was creditable; the display of Durham cattle, by Martin Prendergast, of the town of Chautauqua, would compare favorably with any other county in the State. The town of Elliott had a fine show of working oxen.

The number of horses was large, and of a character to satisfy any lover of this noble animal. Sheep and swine were not equal to former exhibitions.

The farmers of this county are determined to make it one of the best dairy counties in the State, and the uniform excellence of many of the samples exhibited showed the creditable progress already made. The past season was very cold, and in the southern part of the county the crops were not an average. The society have the strongest encouragement for further efforts to increase and extend its usefulness.

CHENANGO.

The transactions of this society have been published in pamphlet form, giving a full account of the proceedings of the society, and the annual address, delivered by the Hon. Daniel S. Dickinson, at the annual fair. We give, from the reports presented to the society, such extracts as will show the progress which is making by the farmers of that county.

The committee to whom was referred the dairy farms, for which was offered a premium of twenty-five dollars, to the dairyman who produced the most value in proportion to the cows kept, not to be less than ten cows, awarded the premium to John Shattuck.

MR. SHATTUCK'S STATEMENT.—BUTTER DAIRY.

The amount produced from twenty-five cows:

Whole amount of butter made, 4,601 lbs.	
Sold 4,350 lbs. at 25 cents,	\$1,087 50
Used and on hand, 251 lbs. at 25 cents,	62 75
Milk sold,	2 05
One veal calf,	5 00
Ten calves, raised on skimmed milk, and sold at \$5 each, ...	50 00
Fourteen deacon skins, sold at \$1.10 each,	15 40
One pair of calves on hand, value of increase,	12 00
<hr/>	
Whole amount of butter, &c.,	\$1,234 70
Whole amount of pork made, 2,230 lbs.; sold at \$6.75 per	
100 lbs.,	\$150 52
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Carried forward,	\$ \$

Brought forward,	\$150 52	\$1,234 70
Amount of lard, 60 lbs. at 1s. per lb.,	7 50	
	<hr/>	
	\$158 02	
Deduct for value of hogs in spring,	\$28 00	
Amount of grain fed,	12 50	
	<hr/>	
	40 50	
	<hr/>	
		117 52
Whole amount,		<hr/>
		\$1,352 22

Average per cow \$54.08, without any allowance for milk and cream used in family.

STATEMENT OF MAKING BUTTER.

The milk is set in tin pans, and allowed to stand about thirty-six hours in warm weather, when the cream is taken off and churned by dog power. Temperature of cream about 55° Fahrenheit. When the butter comes, it is removed from the churn, and washed in cold water until the buttermilk is removed, and then salted with Ashton salt, about one ounce to the pound of butter, and covered tight and set in the cellar twenty-four hours, when it is worked over and packed in firkins, being careful not to work it only just sufficient to remove the buttermilk.

To preserve through the season, the butter is kept covered with strong brine, from the same kind of salt used for salting the butter. Cost of making the butter is about seventeen cents per pound.

Feeding calves.—Generally let them suck until the milk is good, and then commence feeding them skimmed milk on the start, letting it stand twelve hours at first, and as they grow older, let it stand longer, and they will soon get so as to drink it sour and do well.

Fattening pork.—Four shoats, last spring weighing about eighty pounds each, and four pigs; fed them nothing but sour milk and buttermilk from the dairy until October, when they were fed with a little soft corn, not enough to destroy their appetite for the milk, and continued to feed in this way until butchering time. They consumed fifty bushels of ears, valued at twenty-five cents per bushel.

JOHN SHATTUCK.

PREMIUM FARM STATEMENT.—250 ACRES.—175 ACRES UNDER IMPROVEMENT.

Cost of farm,	\$8,000 00
Cost of stock, farming tools, &c.,	1,500 00
	<hr/>
	\$9,500 00
<i>Stock.</i> —Thirty-one cows (two farrow), four heifers, six yearlings, one calf, one yoke of oxen, one span of horses.	
Cheese made, 10,705 lbs., sold for,	\$1,270 75
Butter made, 1,578 lbs., sold for,	303 91
	<hr/>
Carried forward,	\$1,574 66

Brought forward,.....	\$1,574 66
Hay sold and on hand,	280 00
Pork and lard sold,	54 67
Beef and hides sold,	38 00
Neat cattle sold,.....	173 00
Calves and skins sold,.....	33 00
Fruit and cider,	37 25
Potatoes,.....	8 00
Eggs and poultry,	10 00
	<hr/>
	\$2,208 58
Amount paid out for labor, ...	\$140 19
Interest on capital,	665 00
	<hr/>
	805 19
	<hr/>
	\$1,403 39

No account made of butter, cheese, cream, and milk used in family, nor of produce used or stored for family—(no account charged for work of self and family).

Spring Wheat.—Twenty-three bushels per acre; E. Condo Chase. The field had been mowed for a number of years previous to 1857, when it was broken up and planted with potatoes, which proved an entire failure. Last year ('58) it was well coated with barn-yard manure, plowed, and well dragged, and planted with corn, producing a good crop. May 2d and 3d ('59), plowed from six to eight inches deep; on the 4th, sowed one bushel Rio Grande wheat, first washed in brine; thoroughly dragged, followed by a bush, after seeding with timothy and clover. Cradled 27th August; August 30th, raked, bound, and put in barn. Thrashed last week in December, with flail; cleaned in fanning mill, producing twenty-three bushels, weighing sixty-five pounds to the bushel. *Soil*, red loam, a portion quite stony, slightly descending to the south and west, and quite dry, containing a little over seven-eighths of an acre.

Oats—Eighty bushels per acre; Edwin M. Haynes. Crop raised on gravelly land, on the Chenango river; had been previously used for night pasture. The previous crop corn; and a part of it previous to corn grew sorghum. Land plowed in April once, and once harrowed previous to sowing, and once after sowing. Sowed in April, three bushels and a half per acre. Harvested in August, and thrashed in September.

Two day's plowing,	\$4 00
do harrowing,	2 00
Cost of seed,	1 75
Harvesting,	2 00
Drawing,	1 75
Thrashing,	2 40
	<hr/>
	\$13 65
Value of crop, \$32. Profit,.....	18 35
	<hr/>
	\$32 00

Winter wheat—Two acres, eighty-five rods; 100½ bushels; H. K. Shaw. Soil, clay loam; fourth crop since broken up; two first, corn; third barley. Plowed eight inches deep, 1st September, and sowed the 15th, two bushels Mediterranean wheat to the acre; harrowed and rolled, and applied twenty bushels unleached ashes. Harvested last of August, and thrashed with machine. Yield, by measure, 100½ bushels. Value of wheat, \$1.62½ cents per bushel; sold mostly for seed.

EXPENSES.

Plowing, \$7; harrowing, rolling and sowing, \$3,	\$10 00
Ashes and sowing, \$3.50; harvesting and thrashing, \$22; 7 bush- els seed, \$12.25,	37 75
	<hr/>
	\$47 75
	<hr/>

Value crop, \$163.31; net value, \$115.56.

PREMIUM BREAD.

Method making brown bread.—One quart rye meal, two quarts of Indian meal, two tablespoons full of molasses; mix thoroughly with sweet milk; let it stand one hour, and bake in slow oven.

Method of making wheat bread.—One spoon full of hop yeast, two boiled potatoes, one pint of water, and make a sponge; and when sufficiently raised, mix hard and let rise, and when it is light, again mold it over and bake when light.

The crop of wheat in the county better than usual. Early sowing and early varieties are less affected by the insect. The crop of Indian corn cut off by the frost in June. Rye an average yield, though injured in some localities by the frost. Barley good quality and average yield. Oats excellent quality, nearly double the usual yield. Buckwheat more than usual yield. Potatoes from 125 to 150 bushels; rather better than an average yield. The only relief from disease has been a frequent change of seed. About half an usual crop of fruit. The condition of our farming is constantly improving; the price of land increasing in price from year to year. The dairy is the prominent interest in the county, and for a few years past, while grain farms have been unsuccessful, the dairy farmers have been growing rich.

CLINTON.

The fair in this county having been adjourned on account of the severe and unfavorable weather, came off on the farm of J. W. Sanborn, at a late period. The weather, both days, was beautiful, and it was improved if the large crowds that assembled on the grounds were any evidence. The number of articles on exhibition, though not large, were of a quality to command the admiration of such as took an interest in the progress of agriculture and the arts generally. The committee of arrangements did their duty in a manner that was gratifying to all, and good order characterized the proceedings throughout. On Wednesday afternoon the address was

delivered by Rev. J. R. Young, in the presence of thousands of hearers, and was listened to with marked interest. He portrayed what he considered the beau ideal of a good farmer, and the truths he uttered, without doubt, sunk deep into the hearts of many who heard them for the first time in their lives. The general prospects of the Society are very encouraging.

COLUMBIA.

The general exhibition was a very creditable one; the exhibition of sheep larger than last year. In dairy products, the competition was good; fine display of poultry. Farm implements, of every description, were well represented. Three hundred and twenty-three entries of stock and implements, and four hundred and forty in the miscellaneous department.

An excellent Address by C. Edwards Lester, which gave good satisfaction.

CORTLAND.

The weather during the exhibition, was very unfavorable, being mostly rainy during the three days of the Fair; but from the manifest interest of the members of the Society, the attendance was much larger than the Board of Management could have expected, and the interest exhibited on the part of the members of the Society under the unfavorable state of the weather, speaks well for the future progress and prosperity of the Society. The entry of stock was highly creditable, and in the mechanical department, respectable.

An exhibition and trial of Mowing Machines in July, was quite spirited and the attendance large.

There were fourteen machines entered for competition. The judges, after very carefully examining the working of the various machines, awarded the first premium to the "Buckeye Mower." This trial of Mowing Machines was the most successful that has yet occurred under the auspices of the Society.

By reference to the census returns for the year 1855, we gather the following items of information: Cortland County contains 308,399 $\frac{3}{4}$ acres, of which is under improvement 194,736 $\frac{7}{8}$ acres, and unimproved, 113,662 $\frac{7}{8}$ acres. Of the various products of the County, we give a few items as reported for said year, viz: Butter, 2,379,259 lbs; Cheese, 708,679 lbs.; Wool, 120,793 $\frac{1}{2}$ lbs.; Maple Sugar, 258,977 lbs.; Maple Molasses, 2,769 $\frac{1}{2}$ galls; Hay, 59,172 $\frac{1}{4}$ tons; Wheat, 29,057 $\frac{1}{4}$ bush.; Oats, 382,786 bush.; Barley, 45,665 $\frac{1}{4}$ bush.; Corn, 240,703 $\frac{1}{2}$ bush.; Potatoes, 155,389 bush.; Flax, 58,269 lbs.; Apples, 851,975 bush. The number of head of Cattle, including Cows owned in the county, 37,676; Sheep, 41,321; Swine, 12,302.

From the foregoing items, it will be seen, that the leading products of the County are *Butter, Cheese, Wool and Pork*. A careful estimate of these four products, gives us in the aggregate, the sum of \$744,092 91-100.

Cortland County has gained a very respectable reputation in the eastern markets, as being among one of the best dairy counties in the State.

The Address before the Society was delivered by D. D. T. Moore, Esq., Editor of the Rural New Yorker, of Rochester, and was listened to with marked attention. He took for his theme, "The Farmer for the Times," at the conclusion of which a unanimous vote of thanks was passed to the speaker, and a copy of the same solicited for publication.

DELAWARE.

Owing to the location of the Fair, the exhibition of thorough bred stock was not as fine as has been shown at some previous exhibitions, though very creditable in the leading breeds of cattle. Grade Durham and Devons are to be found in almost every neighborhood; and Herefords are highly prized in localities where they have been introduced.

Dairying being the main reliance of our best farmers, no improvement will be knowingly made in the dairy stock at the sacrifice of its milking qualities. Our farmers have been improving the native cows in this respect, for the past twenty years. Now the maximum yield of butter in the best dairies is 200 lbs. per cow; whereas, twenty years ago it was not probably over 100 lbs. It is not strange that the farmers are slow to exchange this stock which so commends itself in the pail and in the firkin, for any breeds untried in this respect, however beautiful to the eye or valuable for other purposes.

The number of grades in the county will soon give our dairymen an opportunity of fully testing their value.

The great demand for working oxen in the lumber districts, makes the raising and training of oxen an object of interest and profit. The Devons are in very high favor as working cattle.

Sheep.—The coarse-wooled varieties seem to be taking the place of the fine wool; but the wisdom of this change is doubtful. Of horses it is doubtful whether a wise course is pursued; for little regard is paid to quality. With good management in the selection of breeding stock, the average price of our horses at six years' old, might realize \$150, as well as \$100 under present practice.

During the Fair an evening supper and meeting took place; and the subjects of drainage, stock raising, butter making, &c., were profitably discussed; and it is doubtful whether those present derived as much real benefit from the exhibition as from what was learned at this meeting.

Short as the time has been since Delaware county was first settled, it has been long enough to show the sad effects of a pitiless exhausting system of cropping. The attention of the farmers is being aroused to this subject. We begin to understand that it is not alone moneyed institutions that are ruined by bad management—that the rich soils cannot withstand a continued "run" without corresponding deposits. It is only the Infinite that can always give without receiving.

A large portion of the soil of this county is clay hard-pan, with a thin top soil. It was heavily timbered with hard wood, and for many years after being cleared, bore great crops of grass. It was considered our best and most natural grass land; but since the stumps, and roots, and stones have been removed, the top soil seems to have settled cold and dead upon the hard-pan. It grows wetter year by year; heaves in the winter and parches in the summer. Of course the crops hardly pay the labor. Where is the remedy? Did the roots of those giant trees form a natural drainage? and must we resort to stone and tile? This is a question that we can not dodge. Some few are meeting it boldly; and, in so doing, are laboring for the whole county as well as for themselves.

The annual address, and one of very great merit, was delivered by Elihu Burritt, of Connecticut; and extracts from it are furnished for publication with this report.

The Society is in a most healthy condition; and the condition of the Society is not a bad index of the farmers.

Rough as Delaware county is, it is doubtful if those who have left our hills for the Western prairies have been more successful than those they left behind.

There is one peculiar feature of the leading business of this county that deserves notice. The dairy furnishes suitable labor for each member of the family. While the father's scythe is swinging at early dawn in the field, the boys are bringing in the brimming pails—the daughters are skimming the golden cream—the mother is packing down the yellow butter, rich and golden as a miser's treasure. Thus each individual contributes to the general prosperity of the family. Nor can it fail to be a gratifying thought to the sons and daughters, wherever they may wander, to remember that their labor helped to improve and adorn that spot which, as the home of their childhood, must ever be an object of affection.

S. F. MILLER, *President*.

ABSTRACT OF ELIHU BURRITT'S ADDRESS.

No industry to which human hands were ever set, since the first pair were made, is deserving of higher estimation than that of the farmer. For, of all the toilers of the earth, he stands in the closest copartnership with Divine Providence in its realm of Nature. See, now, the conditions of this copartnership; the capital which each invests in one summer's crop. The wheels of the season might turn on forever, scattering rain, dew, light and heat, and every germinating influence, but unless it were "belted on" to man's industry, it would not turn out a sheaf of wheat or a loaf of bread. But see what comes of the connection, when a pair or two of hands and hoping hearts join their activities to the revolutions of that wheel. How generously Nature divides with man the joy and honor of the crop! How she works, with all the sublime and minute economies of the seasons, in this partnership of toil! The very shape of the earth's orbit, and all its million-mile-march stages around the sun, as well as the

fine dew-distillery of the evening sky, are brought to bear upon the production of those fields. See how the light and heat are graduated to the growth of those acres of corn; see the temperature that nurses it into the blade, then into the stalk, then into the silken settings of the ear. See what purple curtains are hung around the horizon; what drying, jocund fall winds blow; what a red-faced sun glows upon the ripening ears, reddening them to Indian summer tints, as they peer from the white lace drapery which enfolds them. Look at that sight, and never more let a murmur of discontent stir your lips when you talk of merchants, manufacturers, or joint stock companies, or any other occupation. Joint stock companies indeed! What company of that sort ever found on earth, can compare with the joint stock company which carries on the smallest farm? What a firm of active partners have we here! What a diversity of capital is invested in the enterprise! What sympathy and co-working! Where falls one drop from the moistened brow of the farmer, there fall a thousand of germinating dew from Heaven, and the combination touches the life of every plant and blade with a new vitality and verdure.

There is another feature of the farmer's position which should be noticed in this connection. Of all the utilitarian producers who work for human sustenance and comfort, he is the only one who feels an interest in the productions of his industry independent of their money value. The manufacturer sees in his wares the representatives of so many dollars. They are mostly the productions of a single day, or of a week, at longest. In this short period, twenty-five per cent of human and seventy-five per cent of machine labor, have brought them from inception to perfection, ready for market, all labeled, packed, cased or baled. Doubtless, he feels no little satisfaction at the quality as well as value of his goods, and estimates the pecuniary advantage he will realize from their high reputation. To this extent—no farther—goes out his heart-interest in them. As he walks among his well corded bales or banded boxes, "the main chance" is in his mind and eye. There is no impulse to a cosy patting, or to any expression of attachment, by word or look. Reduce bale, box or package to its constituent values, and you have, as the *residuum*, a certain number of red cents.

Now, let us turn to the farmer and his productions. Every animal which he houses in winter or pastures in summer; every crop of grain, grass or roots; every tree that flowers for him in spring, or fruits for him in autumn, attaches itself to him by nicely graduated sentiments of interest. They are a concentric extension of his family relations, and they all resemble, in growth and development, the family characteristics. They all have an infancy to be nurtured with care, hope and faith. Look at that family horse—he is a little grayish about the eyes with age, but still most likely called "the colt." He was young when the farmer set his first baby-boy on his back for a ride around the yard. For ten years or more, that homely horse has borne the heat and burden of family service. His very neigh, as he hears the farmer stirring in the morning, is a voice half

human to every member of the family circle, and has a speech in it which the youngest child understands. Half a dozen infants within that period, have been held up in those broad, thick hands, to "pat pony" on the back and dabble their little fingers in his mane. What recognitions of sympathy have passed between him and his master, in toiling, burning hours of summer, or when plunging through drifted snows, to a common home in winter! Does not the owner of that horse see in him a worth which copper cents cannot represent? Then, there is that pair of broad horned Devonshire oxen; they were born under his roof—his barn roof, which is socially a continuation of that under which his children were born. They are six years old, of the same age as his youngest boy. His mother weaned him, and his father weaned them at the same time; and now they are large, staid, dignified oxen, with necks hardened to the yoke. Their great round eyes beam with intelligence and honesty. As he unchains them from the plow and lets down for them the pasture bars, the uncouth and odd words which he utters by way of benediction, may not be in the dictionary, but they bring a new light to those horned faces like the sunshine of gladness. There is something more than the sheer value of coined copper which he sees and feels in those oxen. So it is with the remoter circles of his relationships—with the trees he plants, whose life is to outlast his own and bear fruit for his children. They have their infancy and their nursing. Almost next to the baby's footing the carpet's space erect for the first time, is the ripening of the first apple, peach or pear, on one of the little trees which he has tended and nursed with such care. So it is with the growth, ingathering and enjoyment of all his crops. The shortest lived one of the whole requires three months or more of skillful cultivation or useful attention. Thus, all he sows and reaps, has a resemblance to the different stages of human existence, and begets within him an interest in his productions unknown to the banker, merchant and manufacturer.

There is another point of view in which the farmer's position and occupation may be considered to his advantage. The strongest love of country attaches itself to the home which he makes for himself and his children. Here the most enduring forms of fervid patriotism have their birth and culture. What a nation would be if it were one continuous city, and fed from foreign lands, we know not, for no such case has ever existed. But it would be difficult to conceive how strong local attachments would ever be formed under such circumstances; and where they do not exist, the love of country must be a weak, uncertain sentiment. Take one of our large cities, for example, and walk for half a mile along a street of "brown stone fronts," or of stately brick houses with marble door and window sills, all after the same pattern, insomuch that a child born in one of them would not distinguish it from a dozen others without the help of its nurse or companion, who can read the number. Here are houses, inside and out, as much alike as if cast in the same mould. One may be a little nearer the end of the street than another, and this may tend to individualize it from

the rest. But how is a child to throw the tendrils of its young affections around such a home and cling to it through life! If traveling in distant lands, in young manhood, how is he going to individualize No. 10 from No. 11 or 12, and make it as distinct from all other localities as his own being is from all other forms of human existence? What a small object for his yearning affections, streaming homeward over the ocean, is the engraved plate on his father's door, differing only in one figure from its neighbor on either side? Then add this faint, undeveloped localization, the contingency of rentage and removal two or three times in a dozen years to other brick houses of the same mould, and you have the poorest school under the sun for the education of home attachments and strong-hearted patriotism.

Now turn to the farmer, wherever he owns and tills the soil, especially in New England and the Middle States. However few or many the acres he calls his own, whether they lie in valley, on hillside or mountain, his home is as strongly individualized from that of his neighbor as his own face is from that of the same man. His homestead stands out distinct, in prominent features, from all other inhabited localities on earth. It is marked with rocks, nooks and dells which differ from all others ever grouped within a mile's circuit. The very brook which threads the meadow with its rippling music, runs through his with a different curve, under differently jutting banks, making different coves for the little speckled and red gilled fishes, which his children watch with as much eager-eyed interest as if they belonged to the farm, as much as the pied calves in the pasture, or the chickens in the barn-yard. The very squirrels which home themselves in the great walnut or butternut tree by the house, are regarded by his boys, as *attaches* to the family circle. The mountain and valley scenery from his door, or from the opening in his orchard, is all unlike the view which any other point commands in the whole country around. Here, then, is a home which the heart, in infancy and age, in joy and affliction, in all the vicissitudes of human life can cling to, with a separate object for every one of its thousand tendrils to clasp in yearning embrace. Here is a home that it can individualize and grasp in its dreams in far off lands. His youngest child, before it can pronounce the word, recognizes with its short-sighted vision, this birth-place of its existence. Its little eyes and baby hands run out after it, beaming and bouncing and trittering in its mother's arms for gladness, as they return from a visit at their nearest neighbors. That love of country, that patriotism which endures to the end, though that end be on the scaffold, grows with the growth and strengthens with the strength of these home attachments. In view of these influences and characteristics of his occupation, who has a right to say, that the farmer is not entitled to rank himself in the very vanguard of society?—to feel that he stands as near as any living man to the great virtues and destinies of the nation?

Let us now glance at the farmer's personal comforts and capacities of enjoyment, as compared with those of other positions. We have all heard of men called *epicures*; men who make it the study of their lives to please

their palates with the most delicious viands and drinks; men who will hunt a whole day for a couple of tender birds weighing an ounce each when dressed; who are great amateurs in *juleps* of different flavor, and *punches* iced and seasoned after an elite fashion. Compare all the relish with which such men pamper their appetites, with the personal enjoyments of that man of the bronzed face who earns his bread by the sweat of his brow. Why, the fabled deities of Mt. Olympus, who breakfasted on ambrosia and nectar juleps, never knew anything of the pleasures of appetite compared with the farmer. So with sleep. How many thousands of men, clothed in fine linen and faring sumptuously every day, would give half their fortunes for the deep enjoyment of the farmer's slumber!

We have noticed several distinguishing aspects of the farmer's position; the dignity, comfort, and patriotic tendencies of his life and occupation. What he has been in past years of self-depression as a citizen, is no criterion by which to measure the mental status and stamina to which he ought and is yet to attain. Surrounded by such influences; standing in such relations to Nature, Providence, and his fellows of other occupations; living and laboring from morning until night in such close companionship with the seasons, with all the beautiful economies and picturesque sceneries of creation; with all the living literature of its eternity-bound volume turned over by day-leaves before his eyes;—with all these perpetual and gratuitous teachings of the outward world on one hand, and with all the fountains of human literature which stream towards him on the other, he sins against his duty and privilege, if he does not reach and sustain the best rounded mental and moral character, the strongest stature of sterling common sense and general knowledge, of any member of the community.

DUTCHESS.

Owing to the unfavorable weather the exhibition was not equal to those heretofore held.

The Agricultural Hall was well filled with vegetables, fruit, flowers, needle work, domestic manufacture, &c., and a fair show of implements. But the stock department was very deficient as to numbers. There were some superior animals, and among them some of the best fat cattle ever shown in the county. This unfortunate year has not discouraged the farmers of the county—and hereafter, it is believed, the Society will be enabled to show a real advance in all that can contribute to the prosperity of the farming interest.

FULTON.

Winter wheat has been a full yield, and of fine quality, and but slightly affected by the midge; and spring wheat has been a fair average crop; corn but half a crop, much injured by frosts. Rye, a good crop. Barley fine quality, and above the usual yield. Potatoes about 150 bushels per acre—some very fine crops; and some still affected by the disease. Peas,

usual yield, no disease ; we sow about first of June to avoid the bug. Hay, one and a half tons per acre ; drought affected the crop in some portions of the county. Of fruit not quite an average yield ; some orchards affected by the borer ; common, more than grafted trees, affected. More draining being attended to profitably, and a steady improvement in the condition of farming.

E. BRIGGS, *President*.

GENESEE.

The frost injured the winter wheat crop ; it promised early, at least, twenty bushels per acre—but the actual yield about ten bushels. Spring wheat from twenty to twenty-five bushels ; much better than usual. Corn was injured by both early and late frosts. Winter barley also affected by frosts, yield, perhaps, thirty bushels ; oats were injured by grasshoppers, and the yield about thirty bushels. Potatoes better than usual—one hundred and fifty bushels per acre. Fruit, good, where it escaped the frost ; in some localities all destroyed. Hay, only three-quarters of a ton per acre, in consequence of frost.

There is a gradual change in the county from wheat growing to other crops. More wheat, however, sown this fall than there has been since the insect has been so destructive to the crop.

N. K. CONE, *Secretary*.

GREENE.

The exhibition of the Society, as compared with preceding ones, was more extensive, showing a continued improvement. A large show of blooded stock was upon the grounds, including Durhams, Devons, Ayrshires and Alderneys. Fine show of native cattle and working oxen ; and in the various departments the show was creditable to the county. The Rev. Henry J. Fox delivered the annual address, which was full of instruction.

The past year gives abundant evidence of progress in agriculture and prosperity in our Society ; the resources of the county are being more and more developed ; the past season has been eminently prosperous. Upon the whole there was universal gratification expressed by all in attendance at our annual fair, and a universal determination to make the next fair still more attractive and interesting.

N. P. JONES, *President*.

HAMILTON.

A county society, for the first time, has been organized in this county. As yet the county has never been appreciated, and it is deemed proper to

give such facts as will, at least, call attention to a portion of the State which has great capabilities, and which, if properly developed, will add largely to the resources of the State.

Hamilton county is twenty-five and a half miles wide, by sixty-one miles long. It contains, therefore, over a million of acres of land, more than nine-tenths of which is in forest. Its population, by the last census, was about 2,553.

At the last meeting of the board of supervisors, a resolution was passed which materially changed the boundaries of nearly all the towns; and by the operation the town of Gilman was absorbed in the new towns of Indian Lake, Lake Pleasant and Wells. The arrangement will prove of lasting benefit.

The county is well watered by the Sacandaga, Jessups, Indian, and other rivers, and by numerous lakes.

AGRICULTURAL SOCIETY.

A meeting of the citizens, called for that purpose, was held at the Court House, in Lake Pleasant, on the 12th October, 1859. It was called to order by Hon. C. H. Brownell, County Judge, on whose motion, Hamilton Winchell, of Morehouse, was made Chairman, and W. N. Clark, Secretary. Articles of association were presented and approved.

On motion, the following officers were appointed for the ensuing year.

President, Hon. Richard Peck, Wells; First Vice-President, Havilla Winchell, Morehouse; Second Vice-President, Edmund Anibal, Hope; Third Vice-President, William Burnham, Wells; Secretary, Joseph W. Fish, Lake Pleasant; Treasurer, Isaiah Morrison, Wells; and sixteen Directors.

B. C. Butler, of Warren county, Hon. G. S. Batchellor, of Saratoga, Mr. Rosa, of Fulton, and Judge Brownell, of Hamilton county, were then called out, and responded to the appeal in behalf of the farmers of Hamilton county.

Mr. Butler said that he had great gratification in addressing the farmers of Hamilton county on the subject matter before them. In common with others he had obtained the idea that from some cause the county of Hamilton was not fitted by its agricultural capacities to sustain a population; but he had seen so much, and heard so much, that he must believe the evidence of his senses; and his opinion on that subject had been entirely changed. There were now exhibited potatoes which measured nine inches in length, and weighing one and one and a half pounds each. A turnip which was two feet eight and a half inches in circumference, and whose weight was ten and a half pounds. His observation had shown that the soil was a rich, black muck, or much similar to Lewis county, and inquiries elicited the facts that the grass was rich and sweet. The burthen of hay was from one and a half to two and a half tons to the acre; that the meadows would bear a continued cropping for a series of years. That the weight of grain per bushel, was large, oats being thirty-six lbs., and corn

65 lbs.; and the yield of root crops per acre, was equally great. The average of potatoes was 225 bushels per acre, and of turnips over 400 bushels.

These things show at least that the soil was not wanting in elements of fertility. It was well recognized that a good soil is the same all over the world; and that the climate alone is the criterion of production. A good soil in Texas would raise cotton or sugar cane, and in New York would raise wheat and corn. In regard to climate it must be borne in mind, that Lewis county, having an equal elevation of fifteen or sixteen hundred feet above tide, had borne off the great premiums of fifty dollars each from the State society on grazing, butter and cheese farms. The complaint was, the long winters and severe frosts, but it seemed to him the real question was one of cost; whether it was cheaper to winter a stock in Hamilton county than elsewhere, because if hay was worth forty dollars per ton it would be four times as expensive to winter a given number of cattle than if it was only ten dollars per ton; if the season for foddering was two weeks longer, still it was cheaper because produce could be raised so much cheaper. The county was evidently adapted for dairying; as nice butter as he ever tasted was made by Judge Fish of Lake Pleasant. There was also excellent cheese, and the chairman of the meeting, Mr. Winchell, had made a statement that from a dairy of twenty cows, he had already made the present season, 4000 lbs. of cheese and 800 lbs. of butter. Mr. Butler further remarked that the difficulties under which Hamilton county labored, were:

1st. The fact that large tracts of land were held by non-resident proprietors who paid no attention to their development, and many of whom only looked to them as a resource or means of revenue by the cutting off and floating away timber. If, as in Greene, Lewis and other counties, the proprietors had lived on their estates, and given the country the benefit of their intelligence and education, and of course a proper direction to public improvements, the country would have long since been settled.

2d. Another difficulty was the roads. If the common highways were improved so as to be passable, it would be equal to the reduction of the actual distance one-half. The country should be made inviting, and all obstacles to immigration removed. In regard to this society, it had a right to claim the fostering hand of the State, and it would get whatever the members applied for. It would be an advertising medium for the whole country, exhibiting, as it would if properly conducted, the luxuriant productions of its soil, which, in some respects, could not be surpassed.

On the 16th of November, the society again met when after a short speech from Judge Peck, it was,

Resolved, that application be made to the Legislature for aid, to the amount of \$100 per annum, out of the unexpended appropriations for the benefit of agriculture. A premium list was then made out for the ensuing year, when the society adjourned.

STATEMENTS.

LAKE PLEASANT—*Hon. Joseph W. Fish.*

My farm consists of seventy-five acres of cleared land. I keep thirty six head of stock and four horses; I have nine cows and have made, the past season over 1000 lbs. of butter. Cut forty tons of hay (a light crop), had two acres of wheat, four acres of oats, and had 200 bushels from the same, four acres of buckwheat, and 100 bushels from the same, and two acres of potatoes, and raised over 300 bushels from the same. Hay worth about eight dollars per ton.

John Gilman has 200 acres in farm, 100 cleared; good buildings; 400 rods of stone wall; keeps thirty-four head of stock, ten cows; made about 1000 pounds of butter; had eleven acres wheat; ten acres of oats; three acres of potatoes, raised 350 bushels; cut forty tons of hay.

Henry Camrike exhibited a flat turnip whose weight is ten and a half pounds, and circumference is thirty-two and one-half inches; weighed eleven whose weight was 111 pounds. Has a farm of 160 acres, thirty-five in cultivation; raised 100 bushels of turnips on one-fourth of an acre; keeps three cows, and cuts twenty tons of hay.

ARIETTA.

Wm. Schuyler has forty acres cleared; had one acre of potatoes and raised 150 bushels; cuts twenty tons of hay; 600 sheaves of rye, and 200 sheaves of wheat well filled.

MOREHOUSE.

Havilla Winchell keeps twenty cows, and made this year (1859) 4000 lbs. cheese and 1000 lbs. butter.

ADOLPHE ROUX, *Supervisor, &c.*—I have this year kept fifteen cows, and have made about 1,500 weight of butter. The cows are simply pastured in the summer, and in the winter are fed on hay, and in the spring are fed a little shorts and grain in addition. We churn every day by hand. The milk stands about a day and then the cream is moved into a churn together; the butter is then worked over by hand until the whey is separated, when it is salted with Liverpool salt and stands all night, and the next day is worked over and put into a firkin. Have forty acres of hay land, and this year cut forty tons of hay. My potatoes have yielded at the rate of 200 bushels to the acre.

HOPE.

Ira Brundage raised 300 bushels of potatoes from $2\frac{1}{2}$ acres, 133 bushels buckwheat, 75 bushels oats; $2\frac{1}{2}$ acres of spring wheat, and cut 30 tons of hay.

INDIAN LAKE.

This town, as now organized, is composed of about seven townships, and has an area of 125,000 acres, of which about 5,000 are covered with water or marsh, and the rest is most beautiful farming land. It is comparatively level with slopes towards the east and south. Six years ago, the only two inhabitants living there were Risk and Fabes—now there are twenty-five farmers, whose productions the past year have been as follows:

1859.—STATISTICS OF AGRICULTURE.—INDIAN LAKE.

FARMERS.	Wheat, bush.	Acres.	Rye.	Acres.	Oats.	Acres.	Potatoes.	Acres.	Turnips.	Acres.	Hay, tons.	Butter, lbs.	Cows.	Oxen.	No. of head of young stock.
J. B. Eldridge			300	12	800	20	800	4							
George Griffin			15	1 $\frac{1}{4}$	300	10	500	5	300	1 $\frac{1}{4}$			10	4	25
Francis Velle	15	0 $\frac{3}{4}$	25	0 $\frac{1}{4}$	175	4	130	2	10	130	4	2	30	2	7
Lewis Gerard			60	4			350	3			30	25	7	2	32
G. G. Porter	40	1 $\frac{1}{2}$					290	1			12	20	2		6
Lewis Willman					75	4	120	0 $\frac{1}{4}$							
Safford Perry					60	2	145	0 $\frac{1}{4}$			4 $\frac{1}{2}$	3			
Almon S. Reed															
Warren B. Persons			50	2			500	2 $\frac{1}{2}$	300	2	6	4	3	2	6
David Oritt					120	2 $\frac{1}{4}$	500	2 $\frac{1}{2}$	73	1	11	7	2	2	4
William Persons				5			30	0 $\frac{1}{4}$			12	14	2		2
Isaac Pinney			100	6			300	2 $\frac{1}{2}$			8	12	1	2	
Nathaniel Gilson	20	1	20	1			450	3	300	1 $\frac{1}{4}$	5	5	1		2
Huston Simpson			75	3	300		300	2	100	1	25	65		2	1
Samuel Pain	8	1 $\frac{1}{4}$	40	1 $\frac{3}{4}$			225	1	100	3	12	9	3	2	6
David Rogers															
William Brumley					150	10	200	1 $\frac{1}{4}$			22	40	1	2	1
D. C. Forbes							250	1 $\frac{1}{4}$	300	1 $\frac{1}{4}$			1		
Prentiss Brown							400	3	50	0 $\frac{1}{4}$			1		
Hiram Bell			20	2			130	1			7	20	1		
S. G. Porter							200	1			4	10	300		6
Dormin Parker							175	1			4	5	1	2	1
Average	73	4	755	30 $\frac{3}{4}$	1,680	52 $\frac{1}{2}$	6,095	38	1,523	9 $\frac{1}{2}$	227 $\frac{1}{2}$	329	2,900	43	99
	18.25		25.1		32		160								

1858.—STATISTICS OF AGRICULTURE, FOR THE TOWN OF LONG LAKE.

FARMERS.	Wheat, bush'ls.	Acres.	Rye.	Acres.	Oats.	Acres.	Buckwheat.	Acres.	Potatoes.	Acres.	Corn.	Acres.	Turnips.	Acres.	Hay, tons.	Acres.	Butter.	Cows.	Cheese.	Oxen.	Young stock.	Horses.	Hogs.	No. in family.
Wm. Kellogg.....	22	1 $\frac{1}{2}$	21	1	150	8	40	1 $\frac{1}{2}$	200	1	20	1	40	45	100	2	10	2	2	2	10	2	1	4
Thomas R. Carey.....																								
Robert Fulton.....																								
Daniel Keller, Jr.	7	1 $\frac{1}{2}$	16	1	150	5	22	1 $\frac{1}{2}$	200	1	30	1	40	25	.....	4	.....	4	2	2	4	4	2	14
Robert Shaw.....																								
John L. Buydeen.....																								
E. Palm.....	10	1 $\frac{1}{2}$	100	4	25	1 $\frac{1}{2}$	200	1 $\frac{1}{2}$	200	2	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	2	2	2	6
Asa F. Kellogg.....	12	8	35	2	28	1	100	1	75	.....	30	.....	.....	15	.....	.....	.....	.....	.....	.....	2	2	2	6
Peter Shaw.....	8	10	30	1 $\frac{1}{2}$	20	1	300	2	300	2	.....	.....	.....	14	.....	.....	120	.....	.....	.....	4	3	2	3
George Shaw.....	4 $\frac{1}{2}$	3	20	.....	13	1	200	1	200	1	8	.....	.....	5	.....	.....	.....	.....	.....	.....	2	6	3	5
E. Welsh.....	8	.....	20	.....	16	.....	225	.....	225	.....	.....	.....	10	.....	4	.....	.....	.....	.....	.....	2	6	1	7
J. B. C. R.....	8	.....	14	1	25	1	225	.....	225	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	10
J. Smyth.....	10	1	8	1	30	1	100	1	100	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	3	2	1
Daniel B. Collins.....	.....	.....	28	2	33	1	8	1 $\frac{1}{2}$	200	1	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	2	.....	2	3
J. Kelb.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2	6
	81 $\frac{1}{2}$	5	108	6 $\frac{1}{2}$	763	32	287	14 $\frac{1}{2}$	2,320	34	88	3	50	4	129	115	220	7	2	18	34	22	12	74

The following statement exhibits a handsome margin of profits of Walter Phelps, Jr., who owns a farm in the town of Indian Lake:

My farm is situated in Indian Lake, township 33, Hamilton county. It consists of cleared land, 53 acres.

Cost for clearing, \$16 per acre.....	\$842 20
Making 188 rods of fence.....	23 50
	<hr/>
	\$865 70

Crops, 1859.

Hay, 4 tons, \$15.....	\$60 00	
Oats, 1,400 bushels, 75 cents.....	1,050 00	
Potatoes, 500 bushels, 37 cents.....	187 00	
Turnips, 300 bushels, 25 cents.....	75 00	
	<hr/>	
		\$1,372 00

WM. PHELPS, JR.

JEFFERSON.

AWARD OF PREMIUMS ON CROPS.

Winter wheat—Asa Parkinson, Rutland, 30 bushels per acre.

do Asa Parker, Watertown, 30 do

Spring wheat—A. C. Brainard, Watertown, Scotch Fife wheat, 31 6-8 bushels per acre.

Spring wheat—William Rouse, Clayton, China wheat, six acres 42-100, 166 bushels per acre.

Barley—William Rouse, 35 bushels per acre.

do H. McKee, 16 acres, 560 bushels.

Oats—A. Gurnee, Watertown, 88 24-32 bushels per acre.

do N. Francis, 70 12-32 do

Corn—William Rouse, 2 62-100 acres, 211 bushels.

do H. McKee, two acres, 144 60-70 do

Carrots—A. Gurnee, 975 bushels per acre.

Peas—A. Maynard, 28 18-60 do

do Ira Brown, 37½ do

Hungarian grass—W. Morrison, one acre six rods, 2½ tons, and 20 bushels seed.

Onions—George Harris, quarter of an acre, 94 bushels three pecks.

VIEWING COMMITTEES REPORT.

It becomes us to speak and report upon what we have seen and learned on our present tour, but some members of our committee performed a like tour in 1850, and it was then reported that we were anxiously looking forward to the time when we might have a railroad and an inland market for surplus produce. That time has arrived and passed. The result has been decidedly in favor of the farmer. Previous to 1851-'2, we sold our butter on an average not to exceed fourteen cents, cheese at not far from seven cents, barley at about forty-five cents, pork in proportion; and other articles, the prices of which are still fresh in your memory, have increased

in value to make farming not only agreeable but profitable. After a life of toil and hard labor, is it any wonder that many of our forefathers have gone down to their graves and left no inheritance for their sons except an honorable name? or, with the improved agricultural implements, our railroad and prices, would it be surprising should some of our farmers pocket a little cash?

We are pleased to report favorably in reference to the roads and bridges that are constructed across many of the streams that checker our county, which we think are permanent improvements. Nowhere in our journeying through the State do we see better abutments or stronger constructed bridges than at home.

Our suspension bridge, that spans Black river, and has proudly hung upon its cables for two years, has fully met the expectations of its most sanguine friends, was engineered, drafted and built by a Jefferson county mechanic. The roads are generally well worked, and in good order. If we refer back a few years, and compare the present with the past, there is an improvement in regard to destroying thistles, weeds, and in removing brush and other unsightly and cumbersome articles from the roadside. Who, we ask, but a relative of Esq. Slipshod, is not ashamed to throw the brush and rubbish from his orchard and garden, if he has one, into the road.

The schools appear to be in a flourishing condition throughout the county. We have seen a number of good school houses, though but few have play grounds and shade trees. We would suggest the propriety of making our school houses and grounds the most attractive of any place, they being, or ought to be, the chief resort of our children, and should be pleasant. Under the liberal system of the State, many small districts are enabled to keep up an eight month's school, which, in time, must tell for the interest of our sons and daughters. We visited 37 families, and in some places found a good selection of books, and noticed in a number of families Webster's Unabridged Dictionary, which we earnestly recommend to all. We found in the 37 families, 11 monthlies, 4 semi-monthlies, 106 weeklies, 5 tri-weeklies, 5 daily secular, and 18 agricultural weekly papers, which makes a fraction over $4\frac{1}{2}$ weeklies for each family; and we come to the conclusion that at least a portion of the rural population of our county are a reading people.

We have lost many apple trees within the last few years from various causes, and are troubled to find a remedy. Though the case is in our favor, for we have a number of good nurseries, good soil, and a healthy climate for all hardy fruits, and can only recommend perseverance in resetting and taking care of new trees. In proof of what has already been said in reference to our climate and soil, we will refer you to a tree we visited on the premises of one of our Vice-Presidents of this Society, whose branches extend forty-six feet; its trunk measures five feet and two inches in circumference; its boughs are bent to the ground with choice fruit, and the tree is more than fifty years old. The trees our fathers set, and bore

a part of the large apples and other fruit now before us. *They* planted for their own use, and *you*, whether twenty, forty, or fourscore years old, must set trees for yourselves, or, like the sluggard, beg fruit at harvest time. The prospect for a crop of apples in Champion, Rutland, Rodman, a portion of Henderson, Adams, and the southeast part of Watertown, is poor, many of the orchards going to decay, with little or no prospect of much improvement. In Hounsfield, Ellisburgh, a portion of Watertown, Henderson and Adams, there will be a crop of good apples, though not quite an average yield. A prevailing notion with some that trees must be trimmed at a certain season of the year, is in many instances destructive. That time never arriving, the trees are suffered to die an unnatural death for the want of proper attention. Our custom is to trim about eight months each year. Trimming and manuring should never be done with a stinted hand. The failure of an apple crop in some orchards is attributed to the destruction of the tree by the caterpillar, in the months of May and June. To those we have no word of consolation; if you sleep while the enemy is near, you must fall a victim to his prey. It is of no use to set fruit trees until you learn the difference between them and basswood sprouts—the word to some may appear homely, but it is nevertheless true. An orchard may be compared to a mother's nursery, and must receive parental care.

Jefferson county is beginning to hold the rank to which she is justly entitled in regard to her domestic animals. Already we number 100 pure bred cows, heifers and bulls, that are owned in different sections of the county, and are making their mark so prominently that they cannot be passed unnoticed. Their enterprising owners will, ere long, be well compensated for their investment, and their neighbors' herds materially improved. We outnumber any county in the State some 3,000 head of neat cattle. The farmer's attention has been somewhat attracted within the last three years on account of the price of wool, and there has been more attention given to the raising of sheep than formerly. From present appearances we think it safe to recommend that the fold be enlarged and the flock increased. Jefferson county outnumbers any of our sister counties by one thousand horses, and it is not a hard thing to find good judges who claim that we excel in beauty and strength as well as in numbers; and it is a recorded fact, we have furnished one horse whose speed exceeds all others on the track, and we could furnish good horses for Bonaparte's artillery.

Two counties, Herkimer and Oneida, outdo us in the amount of butter and cheese manufactured. Madison and Onondaga raise more barley than we, though it is a hard matter to be beaten, at least, so far as price in market is concerned. The amount of barley with us this season will fall short of a usual crop; a portion of that sown upon greensward was light, owing to the drouth the last of June and the fore part of July. The quality is good, and we heard but little complaint of the joint worm in the straw. There is a full crop of spring wheat, oats, and peas. More atten-

tion should be given to the raising of peas, as the pea bug seems to have been leaving the county within the last two or three years. The quality of hay was never better, but owing to the open winter many of the meadows were frozen out, particularly the old seeded ones were light; hence the necessity of paying particular attention to that branch of husbandry. After a look over the farms in Ellisburgh and some other portions of the county, we concluded the people would not have to go to Egypt for corn this year. The potato crop indicates an abundant harvest; nowhere did we hear of the approach of the disease, and we also came to the conclusion that the sons of the Emerald Isle would know no want this season. There is no place outside the house that should receive as much attention as the garden and door-yard, none should be cultivated with that care, and none will tend to make home more sacred. We draw our inference from the fact that no place is so often visited, and no place is so often referred to by the absent son.

It is useless for us to enumerate what kind of vegetables ought to be cultivated in your gardens, but recommend those you like best. It is advisable to select a plot of ground accessible to the house, in order that every spare moment of time, particularly in the morning, may be improved to the best advantage, though that spot at first may be repulsive and forbidding. One of the best farm gardens we have known for a number of years, stands on low ground, and previous to its being drained was often under water. Almost the worst thing imaginable, is a poor garden fence; it discourages the mother and daughter, and he that would be an industrious son, soon becomes disheartened. We will particularize but one thing, that is the currant; we consider it the most profitable and productive of all small fruits. They should be kept perfectly clean through the entire season and manured to prevent the sun's rays from drying the roots, and thoroughly trimmed each spring, so as to give a free circulation of air. We know of bushes that have received the above treatment, and have not failed of a good crop of currants the last twelve years. Considering the occupation of our first parents, is it asking too much to impress upon you the necessity of cultivating a good garden? Can we close this report in a more appropriate way than to urge the necessity of making home comfortable? and in what way can there be a more profitable investment than in a good door-yard fence and well arranged shade trees?

Gentlemen, in the absence of young and sprightly feet and sparkling eyes to cheer and comfort home, the birds that nestle and sing in those trees more than compensate for all outlays and expense. A clean, dry door-yard, a good garden, a row of shade trees on the roadside and around the farm buildings, add more to the comfort and contentment of home than thousands of dollars invested in bonds and mortgages. The loss of one hundred dollars from the monied man, often causes more trouble than the expense of fitting up ten neat and clean homes.

In the manufacturing of butter and cheese we should try to come to a

standard worthy of Jefferson county. The reason why we are outsold in market is, because our dairies are not uniform. There is a lack of order and sometimes neatness, that should never be wanting, lurks around some dairies. Allow us to call your attention to the dairies of Messrs. Hodges, Rice, Bull, Gibbs, Allen, Scott, President Eames, and most of the places visited, where the mistress of order and neatness presides.

We are indebted to Supt. Dutton for his politeness in furnishing a statement of the amount of butter and cheese shipped over the W. & R. R. in 1858. Also from the gentlemanly collectors of customs of different ports in our country for a statement showing the amount of butter and cheese shipped from different ports the same season by water. There was sent to market by railroad, (exclusive of Canada butter and cheese,) 5,676,695 lbs. butter, 5,029,940 lbs. cheese; and by water, 124,500 lbs. butter, and 118,000 lbs. cheese. The difference in favor of the Jefferson county dairymen on that amount of butter and cheese, sold at present prices, or the usual price previous to an inland market, amounts to something over \$450,000 in one year. If farmers could live at prices previous to an inland market, who should be so dull as to ask if farming could be made profitable? We have the statement of Mr. Dutton, that probably there is as much Jefferson county butter and cheese finds its way to market over the Potsdam railroad as there is of St. Lawrence county butter and cheese goes to market over the W. & R. R. Also the judgment of competent men that there is as much of our butter and cheese goes to market through the Black River canal, as we receive from Lewis county, and finds its way to market over our railroad.

For the benefit of those who may wish to build, we refer you to the cow-barn and dairy house of President Eames, as being in most respects what might be called a model dairy establishment. Also to the premises of Mr. J. G. Scott, of Rutland, whose barn and general fixtures around his dairy, have attained much nearer to what may be called a first class establishment than most men of his, or any age. Your attention is called to a cheese-press we examined in Mr. Inglehart's cheese-house, which we think the most durable and efficient of any we saw, and much less expensive.

We were shown by Hon. C. E. Clark, of Great Bend, a forty-acre corn-field, potatoes, beans, melons, other garden vegetables, and apple trees, all in a thrifty condition, growing on the Pine Plains.

On the farm of Mr. James Parker, of Watertown, may be seen a water-ram laboring under six feet head and fall, that has done good service one year, and waters his house, horse-barn, barn-yard, and a portion of his lots, though they stand fifty feet higher than the spring from which the water is taken. You that have similar advantages can make no better investment than to do likewise.

Our young friends, if what we could say would influence you in the least to improve the homes of your fathers, cultivate and plow the lands cleared by the hands of your grandparents, we should be well compensated

for all time and expense, and predict the time will come, ere long, when you will bless the Providence that made you farmers.

DANIEL PARKER,
V. C. WARINER,
JOHN M. WATERBURY,
H. M. BALL.

LEWIS.

The annual exhibition was held at their new fair grounds, near the village of Lowville.

The show of horses and cattle equal to former years, and good. Butter and cheese department excelled any previous fairs; 21 entries of cheese, and 73 of butter. Total number of entries at the fair, 591.

Address, a very excellent one, by G. M. Bunga, Esq.

CROPS. *Winter wheat*.—C. Miller, of Lowville, 42 bushels per acre, by measure; weighed 57 lbs. to the bushel.

Barley.—H. Mills, Martinsburgh, two-rowed barley; 13 acres yielded 660 bushels; 50 37-48 per acre.

Spring wheat.—Edwin Woolworth, Turin, 2 91-100 acres; yield 67½ bushels of China tea wheat.

Spring wheat.—Anson R. Lee, Turin, 1½ acres of Scotch bull wheat, 49 bushels; previous crop corn and potatoes.

Oats.—Sanford Coe, West Turin, 85½ bushels per acre; previous crop corn and barley.

LIVINGSTON.

Notwithstanding the untoward circumstances that have surrounded us during the past year, yet we have the satisfaction to report that our farmers exhibit an increased interest in the continued success of our enterprise.

Utility has been the aim of our Board of Managers; with that end in view, at the solicitation of many of our progressive farmers, the Society held at Geneseo, on the 7th and 8th days of July last, an exhibition for the trial of mowing machines. On a short notice, sixteen machines of various patents, were entered for this trial. A large attendance of the most intelligent farmers of the county were interested and observing spectators of this unique exhibition. The Committee, to whom was assigned the duty of awarding the premiums offered by the Society, bestowed much thought and labor in applying various tests to the machines competing, and submitted with their award, a written report stating in detail the peculiarities of, and the advantages claimed for each machine; which report having been extensively circulated, must prove of benefit and advantage to the farmers of our county who may hereafter desire to procure for their own use one of these labor saving implements of husbandry.

Our plowing match was held at Avon on the 9th of June. We had the

usual competition and a large attendance of spectators. At the annual exhibition in September, owing to unfavorable weather, the exhibition was not equal to the one of 1858. The first and second days of the fair there was but a small attendance; the third being pleasant, an immense concourse was in attendance.

The exhibition, as a whole, demonstrated clearly that as under prosperous circumstances, our county is not excelled in its agricultural exhibitions, so, under adverse fortunes, it cannot be approached by any county in the State.

MADISON.

In every department the competition was far more spirited than usual. The show of horses excelled any previous exhibition, composed of Messenger, Morgan, Black Hawk and Hunter breeds. The show of cattle the best ever made, consisting of Short Horns and Devons, exhibited by Messrs. Morse and Chapman; annual address by Hon. Charles B. Sedgwick of Syracuse, and was well received by a large and intelligent audience.

In our county we have experienced much trouble and embarrassment from the permanent location of our Society at Morrisville; and the consequence has been, that almost every town in our county has organized a town society, and almost all of our agricultural men's vanity has been fanned by being elected President, Secretary, or Director of these societies, and all their interests are at home, and no sympathy, whatever, with the county society; and from this and other causes, the receipts were barely sufficient to defray the current expenses of the Society.

The crop of winter wheat has been better than usual; no fly; twenty-eight bushels per acre. Twenty-five bushels has been about the yield of spring wheat. The crop of corn seriously injured by the frosts in June, and will not be more than twenty or twenty-five bushels. Barley, about thirty bushels, and better than last year. The other crops grown have been fair, though hay has suffered from drouth. Farming, generally, in the county, about the same as former years.

L. B. KERR, *Secretary.*

MONROE.

There were two exhibitions by the Society; one in the summer for horses, &c., and the usual exhibition in the fall. We have not the particulars of these exhibitions, but understand they were successful and highly creditable to the society, whose officers made the most vigorous efforts to give to the society the best opportunities for the display of their stock and articles.

MONTGOMERY.

The annual fair of the society was a successful one; but no other report, than the premiums awarded, has been received.

NIAGARA.

The second spring show of the society was held on its grounds, in Lockport, on Thursday, the 28th day of April last. The weather was unpropitious, but, notwithstanding, there was a fine exhibition of horses and cattle, of agricultural implements, seeds, &c., &c. Quite a number of sales and exchanges were made among farmers, which is the principal object of the exhibition.

The first day of the annual show was devoted to the plowing match in which much interest was manifested by farmers. The plowing took place on the farm of J. D. Shuler, in a ten acre field of green sward. The ground was in good condition, and the result showed great proficiency in this important branch of farm labor. The principal competition was between the users of the "Scotch" and the Yankee made plows. The former turns a smooth but triangular furrow which looks very fine. It is claimed, however, that it is not as good a fertilizer as the plow that turns a furrow of even thickness. This is a subject that deserves the attention of agriculturists. Two double plows used by boys attracted much attention, and did superior work. The general impression among farmers was that they were improvements.

In the other days of the fair no very marked change from previous years.

The attendance the third day, however, was very large, estimated from ten to twenty thousand. The exhibitions of fruit, implements and ladies' work rendering it very attractive.

The past year has not been one of great prosperity to the agriculturists of this county. The frosts of June cut off many fields of spring crops, while the drought which followed retarded the growth of those which were spared, and very seriously diminished the crop of grass. Corn which was backward was in many localities nipped by the September frosts, and the result has been a large yield of "soft ears." But we are not without some bright features. The wheat crop which has been for the last five years nearly wholly destroyed by the midge, was this year wholly untouched, and the yield to those who sowed was fully equal to the average before that insect appeared. The crop of apples was this year greater than any ever before gathered in the county. It is estimated that from 175,000 to 200,000 barrels have been shipped from here during the fall. The average price has been \$1.25 to \$1.50 per barrel, thus affording a revenue of from \$150,000 to \$200,000. This has done much towards supplying the deficiency of other crops.

M. M. SPALDING,
Secretary.

ONEIDA.

Winter wheat has been of first rate quality—much better than usual. The spring wheat was injured by the midge, while the winter escaped. The early frost injured the corn crop, and the yield not more than one-third

of a crop. Barley has been a good crop; the insect in the lower joint of the straw has done injury, and no remedy is here known. Oats, a fine yield, and quality first rate. Buckwheat, fair crop. Potatoes good, one hundred and fifty bushels per acre, free from disease. The crop of hay not over two-thirds of a crop. The general condition of farming is as good as for many years, and the farmers are gradually progressing in knowledge and in practical demonstration on their farms.

S. A. BUNCE, *Secretary.*

ONTARIO.

The fall exhibition was held on the grounds of the Society, the three last days of September. The number of entries in all classes was 1,619; a slight decrease from the year previous.

As this decrease was altogether in those classes where the Society had lessened the cash premiums, the conclusion is irresistible, that the farmer is like the rest of mankind, stimulated by tangible reward.

With this experience the Society, at its recent meeting, largely increased the amount of cash premiums, in addition to its valuable diploma; without doubt, the result next fall will justify its action. The weather during the fall exhibition, was fair, and consequently the grounds and buildings were crowded with the thrifty and orderly inhabitants of the county.

On the evening of the first day the farmers availed themselves of the opportunity to hear an eloquent and interesting discourse on agriculture and farm life, from the Hon. D. A. Ogden, of Penn Yan.

At the winter meeting, premiums were awarded for the dairy and on field crops. H. H. Brown, of Victor, first premium for largest amount of butter from one cow. The cow half Durham and half Devon. Her feed, at the time of the experiment, was timothy and clover grass; the pasture watered by a small brook.

The lbs. of milk each day, for thirty days, as follows:

June 1, 48; 2, 49; 3, 49; 4, 49½; 5, 50; 6, 51½; 7, 50½; 8, 51; 9, 51; 10, 50; 11, 50½; 12, 51; 13, 51½; 14, 51; 15, 51½; 16, 50½; 17, 52; 18, 51½; 19, 52; 20, 52; 21, 51; 22, 51; 23, 51; 24, 51½; 25, 51; 26, 51½; 27, 51; 28, 50; 29, 50½; 30, 51. Total, 1,522½ lbs.

There were 71½ lbs. butter made from this milk; a sample of the butter was exhibited.

For the best field Indian corn, first premium to Lindley W. Smith, Farmington.

I hereby certify that I have raised, the past season, from one field of 16 86-100 acres, 1,947 baskets of corn in the ear, each basket of ears weighing 46 lbs and 7 ounces, and the corn there contained, 37 lbs. 12 ounces; which makes 73,499½ lbs., and that sum divided by 58, the number of pounds to the bushel, makes 1,267 13-236 bushels; and that number, rejecting fractions, divided by 16 86-100, the number of acres, makes an average of 75 bushels and 8 lbs. per acre.

The soil is a sandy, gravelly loam, descending a little to the north-east. Plowed between the 4th April and the 5th May, in lands of thirty paces each, north and south, at an average depth of ten inches, none less than nine, and some as deep as twelve inches, and well turned over with Mowl's iron beam plow. Whether deep plowing is beneficial or not, I can only judge by the result; but some of my neighbors, and they are good farmers too, thought at the time it was being plowed, that four or five inches was deep enough, and that depth would give a bigger yield than the depth at which it was plowed. However, I conclude that they are of a different opinion now; if not, I shall not agree with them in *this* particular.

The field was rolled May 23d, and thoroughly dragged May 24th and 25th, marked May 26th, in rows three and a half feet apart. Planted May 27th, 28th, and 30th, principally with a double corn planter, and covered with a hoe one and a half inches deep, as I did not dare to risk the planter to cover the seed.

I consider the planter worth double its cost if used only to drop the corn.

June 7th. Plastered and ashed, in equal quantities, at the rate of two bushels to the acre.

June 13th and 14th. Cultivated with a common corn cultivator twice through the rows each way; then again about the 5th July, once in a row each way, which is all the tilling or cultivating the field received. I am well satisfied, however, that if it had been thoroughly hoed, the increased yield of corn would have amply compensated for the extra labor.

The field has been cropped, the last ten years, as follows:

1849—Summer fallowed, and sowed to wheat.

1850—Harvested wheat and seeded to clover, at the rate of 12 lbs. per acre.

From 1851 to 1855 in pasture.

1855—Sowed to barley and to wheat in the fall.

1856—Harvested the wheat and seeded with clover, but it did not take.

1857—Sowed to barley and seeded with clover, but with better success.

1858—Took off crop of clover.

1859—Planted to corn, and raised for premium crop, although not so sure of the premium as I am of the corn. No manure of any kind has been applied to the field since I have owned it, which is about twelve years, and I do not believe there ever was. I have applied plaster and ashes in about the same quantity and proportion as before stated, three years of the time.

The corn planted is a variety of eight rowed yellow, brought from Vermont in 1852; I prefer this corn to any variety I ever used. It is some ten day's earlier, will weigh sixty to sixty-four lbs. to the bushel, and will shell more corn, by weight or measure, from a bushel of ears, than any other variety that I have ever seen or heard of.

I select my seed corn in the fall before cutting it up, from stalks having

two or more ears, put it in a dry place until ready to plant, and deposit from four to seven kernels in a hill. Signed, LINDLEY W. SMITH.

For the best field of rye, first premium to J. L. Johnson, Canandaigua.

The soil is a gravelly loam; the field had been in clover three years. Plowed it about the 20th June, furrows eight inches deep. No work was done upon the fallow during the summer. About the 9th September, the field was thoroughly harrowed, and the seed put in with a Macedon drill, at the rate of one and a half bushels per acre. Harvested about the 15th July; after thrashing and cleaning, the grain was carefully measured, and the yield was two hundred two and three-fourths of a bushel.

The field contains four acres and eight rods, as per certified statement of surveyor.

In addition, I wish to say, (in order to show the profit of this crop,) that from 146 bushels thrashed out with a flail, there were 1582 bundles of straw, for which I received fifty-five dollars and twenty-five cents. The remainder of the crop was thrashed with a machine.

I put the expense of tillage per acre at about two dollars and fifty cents.

Tile drainage.—T. C. Maxwell & Brother's statement will be found in the proceedings of the Society, they having been awarded premium at annual meeting, page ante 158, February, 1860.

William Johnson's statement of draining will be found in Transactions for 1858, p. 226.

Thomas Tufts, of Gorham, reports his results in these words: "Before being underdrained the water would stand in many places from four to eight inches deep, and since the drains were put in the land has been in order to plow as soon as the frost was out of the ground. I began to plow the 17th March; worked and planted to corn the 5th May; had a good yield of corn, which was ready for harvesting the first of September.

ORLEANS.

The show of cattle never excelled in quality. Messrs. Bowen's choice Herefords were on exhibition. The Society is endeavoring to introduce the sale and exchange of farm animals and produce, &c., as a permanent feature of the annual fairs. It is believed such a practice will prove beneficial to the interests of the Society, and accommodate buyers and sellers, and profitable to all concerned.

The crop of apples has been very large, and is estimated at about 200,000 barrels, which were sold by the farmers at an average of \$1.25 per barrel for the fruit alone,—the buyer furnishing the barrel, and the seller picking and barreling the fruit. Our farmers are increasing their orchards largely, and setting considerable quantities of pears and grapes, which thrive well. The peach crop this year was a failure, and for several years past it has been small and growing less.

But little mischief was done in this county this year by the wheat midge,

and farmers are encouraged to sow more wheat this fall than for a number of years previous. The winter wheat raised this year was mostly the red Mediterranean variety; this kind, in the opinion of our growers, resisting the midge best. The average product per acre about twenty bushels. Spring wheat averaged a little less per acre. *One reason for the large yield was, the wheat was sown on the best soils, well prepared and tended, and sown earlier than heretofore.*

A large breadth of Indian corn was planted, which was badly injured by frost in the spring and fall, and on the whole was a light crop. The stalks were nearly spoiled for fodder. This is a greater loss from the fact that the hay crop was a light one.

Considerable quantities of pressed hay have been taken from this county this season; a new article of export to us, which is found to be profitable. (Be careful and supply by manure to balance the hay sold.)

Potatoes are a large yield, and we hear but little complaint of the rot.

We are happy to report greater attention being given to draining moist lands by blind ditches of stone or tile. Those who have done most at it speak loudest in commendation of their work, and profess to receive large profits for the outlay of expense. Lands so drained endure wet and drought equally well, bear better crops, and are tilled with greater ease and comfort.

OSWEGO.

AT FULTON.—There were 281 exhibitors in stock department, and total number of entries in all the departments, 1,136.

AT MEXICO.—The exhibition compared favorably with former years. The number of entries, 953 against 1,055 last year, but in the main departments an increase: horses, 131 against 120; cattle, 150 against 115; sheep, 73 against 59. The decrease in fruit and vegetables was owing to the extreme wet and cold season. Taking it all in all, it was a great competition between farmers and mechanics, and the various industrial pursuits, stimulating a worthy emulation to excel, and well sustaining the farmer's annual festival.

OTSEGO.

The fourth annual fair, under the new organization, of the Otsego County Agricultural Society was held at their grounds, in the village of Coopers-town, on the 28th and 29th of September, 1859. The past season has, in some respects, been detrimental to the interests of our farmers; the cool, dry month of May, together with the frosts in the early part of June, had so injurious an effect upon the growth of grass, that we may reasonably calculate the loss of hay nearly one-quarter that of a good fair crop. Corn, owing to the severe frosts of the 5th and 12th of June, was in many places seriously injured, and in others totally destroyed. But this was somewhat

compensated by a very fine and large yield both of buckwheat and oats. In comparing the number of entries of stock of different kinds of 1859 with those of 1858, we shall find the following gratifying result:

	1858	1859	Increase.
Horned cattle,.....	129	168	39
Horses,.....	86	156	70
Sheep,.....	128	133	5
Swine,.....	20	35	15
Total,	363	492	129

or about thirty-three and one-third per cent increase in the number of entries of stock of all kinds; the quality was considered quite equal to that of any former year. We should all rejoice to see the large increase in the number of entries of horses, as well as the superior condition in which they appeared at the last fair. If the improvement in the breeding of this useful class of animals, for the next four or five years, should be equal to that of the last four or five, our county will not be ashamed to contend for premiums with that of any other in the State. A trial of mowing machines, under the directions of the board of managers, was held on the farm of G. P. Keese, Esq., on Wednesday the 13th day of July, and though the day was the hottest of the season, the thermometer ranging above ninety degrees during the time of trial, still the interest felt in the exhibition was sufficient to keep nearly all on the ground till the close of the proceedings. Eleven machines, comprising nine different patents, were entered for competition, viz.: Ketcham's improvement, 1858, Hallenbeck's improvement; Buckeye mower; Wood's new mower; Allen's mower; Manny's mower with Ball's improvement; Eagle mower and reaper combined; Rodger's machine; Kirby's mower and reaper; Manny's combined mower and reaper; and Ketcham's improvement. All these machines accomplished their allotted work, except the Rodgers' patent, which broke down soon after starting. The committee, taking into view the various requirements necessary to make up a perfect implement, awarded the first premium of ten dollars to the Buckeye mower, for the reason: "that it performed its work well, has a cutting bar adapted to rolling and uneven surfaces, and in compactness and ease of transportation from one place to another is unrivalled." In conclusion the committee say, "that they have had no easy task to decide, where so many machines were in competition, and where all performed so well, and they would say to the farmers of Otsego, that in purchasing they could hardly fail to be satisfied with any of the machines upon the ground, so satisfactorily did all acquit themselves." According to the report of the treasurer of the society, received,

From the ticket office of the fair of the 28th and 29th September, 1859,.....	\$1,175 49
From 394 members,	394 00
From the State,.....	148 00
Total,	\$1,717 49

from these three sources alone. I cite these in particular as the society mainly depends upon them for its pecuniary success. Of the 394 members only about 270 are farmers, and this in a county almost purely agricultural, and numbering at least five thousand persons devoted to the cultivation of the soil. The prosperity of our society depends upon the farmers themselves, and if they allow a feeling of indifference, or a want of interest in its affairs to take the place of exertion and a proper regard for its success, it will need no prophet to foretell its speedy dissolution. It is gratifying to learn that the wheat crop of the present season has, with very slight exceptions, escaped from the attacks of either rust, the midge, or the Hessian fly. The yield too has been very large, particularly of winter wheat, some fields producing from twenty-five to thirty bushels per acre. It is well known that from about 1800 to 1820, Otsego was one of the largest wheat growing counties in the State; but after the opening of the Erie canal the cultivation of this grain rapidly declined. This was owing, perhaps, in part to the extensive introduction of the cultivation of this cereal into the then new portions of western New York, and in part to the impossibility of cultivating this crop with any degree of profit in consequence of the destructive attacks of the Hessian fly. There is again some reason to believe, that as the fly and midge extend their ravages westward, the farmers of the more eastern portions of our country may, with underdraining and more thorough cultivation, once more safely enlarge the area devoted to the growth of this most important of grains.

The hop crop of 1859 is, by good judges, estimated to be about a quarter less than that of 1854, being the year preceding that of the last State census which was then, in round numbers, given at 3,123,000 lbs.; consequently that of last year would not be far from 2,400,000 lbs., which, at the average price of twelve and one-half cents per lb. would give as a result \$320,000. Now estimating the net profit to be seven cents per lb., we have \$168,000 returned to the county from this one product alone; a large sum considering the low price of the article at the present time. On the other hand, if in favorable years, we estimate the crop at 800 lbs. per acre from 4,000 acres, which is about the breadth of land devoted to the culture of hops in the county, we shall have for a product 3,200,000 lbs., which at the average net profit of twenty-five cents per lb., would give for a result the sum of \$800,000 in a year of high prices. Taking then these two extremes as approximations to high and low value, we find a difference of about \$630,000 in this one crop alone. I doubt whether any product of the earth, either vegetable or mineral, taking into consideration its relative value, affords such a fluctuation as to price as we see here. I have gone more particularly into this subject because of its great magnitude to the interests of our county. Otsego stands at the head of all the counties in the Union which devote a portion of their soil to the raising of hops, and it is better that our farmers should see the ups and downs to which they are liable in order to know the precarious nature of the article to the cultivation of which so many have turned their attention.

In conclusion we have no cause for repining, but on the contrary everything to be thankful for, and taking fresh courage we should press forward, having for our motto, "upward and onward."

ALFRED CLARKE, *President.*

PUTNAM.

The general exhibition was in the main about the same as former years. A new feature was introduced—*horseback riding* by ladies and gentlemen in a large circle adapted to that purpose. The object, to enable persons to ride well, and to train horses for the saddle, a matter altogether neglected. It attracted attention, and though a first effort, it obtained the approval of those present. Prof. J. W. Fowler delivered the annual address, well adapted to the occasion, showing the reforms which, from time to time, have been made, and now making in the great work of agricultural improvement. The society's receipts were larger than at any former period. And it is hoped that when some amendments are made in the regulations of the society, a renewed impulse will be given to agriculture in the county.

C. R. WEEKS, *Secretary.*

QUEENS.

The Executive Committee of the New York State Agricultural Society, met at Niblo's, New York city, on the 21st of July, 1841, and appointed a committee to make arrangements for the organization of an Agricultural Society for Queens County. Grant Thorburn, of Newtown, was named first on the committee. Soon after this, the Queens County Agricultural Society was organized, and Effingham Lawrence, of Flushing, elected President. On the 9th of October, 1841, the first members' dues were paid, viz: Singleton Mitchell, Selah S. Carll, Benj. C. Jackson, Israel Hewlett, and John G. Lamberson. The first Fair was held at Hempstead, October 13, 1842, when an address was delivered by Hon. Wm. T. McCoun, Vice Chancellor of the State.

Fairs have been held since then in the following years and places: 1843, at Hempstead; 1844, at Jamaica; 1845, at Hempstead; 1846, at Flushing, and subsequently at Hempstead, Jamaica and Flushing, alternately. The Society was reorganized and incorporated Dec. 3, 1857.

Effingham Lawrence was President of the Society 1841 to 1844.

Singleton Mitchell, of Manhasset, 1845, 1846.

Wm. T. McCoun, of Oyster Bay, 1847.

John A. King, of Jamaica, 1848 to 1855.

Wm. T. McCoun, of Oyster Bay, 1856, 1857.

D. R. Floyd Jones, of Oyster Bay, 1858, 1859.

Albert G. Carll, was Secretary from 1841 to Aug., 1850.

John Harold, Secretary from 1850 to 1859.

During the first eight years, the success of the Society was varied. It was a new thing in the County, and many prejudices had to be overcome. In 1848, the year's receipts from members amounted to only one hundred dollars, and a subscription had to be taken up at the yearly meeting to pay expenses. In 1850, quite an amount of premiums were unpaid. In that year the whole number of members were 149, viz :

Oyster Bay, 38; Flushing, 32; Hempstead, 32; Jamaica, 16; North Hempstead, 10; Newtown, 10; Kings County and New York, 11.

The following year, through the exertions of the energetic President, John A. King, Jamaica returned 67 members, and the other towns a large increase. During the last year, the names of 58 life and 701 annual members have been recorded.

The receipts for the first nine years, were \$2,811.57; for the last nine years, \$11,587.64.

Two thousand one hundred and fifty-two volumes of valuable books on Agriculture, Horticulture, and the Mechanic Arts, have been distributed, and over four thousand packages of seed.

A marked improvement is observed in the agricultural productions of our county since the organization of this Society. Improved cattle and horses, more thorough tillage, farm implements of improved construction, fencing is better, buildings remodeled, and in the article of market wagons, we believe that those of this county are more numerous and superior to any in the State. In the produce of market gardens, we are double any other county. As a proof of the supplies of this article, we have been informed, that 124 wagons loaded with market produce, passed through one toll-gate at Jamaica, during six hours of a single day the past summer, to New York city.

We look with pleasure, at the steadily advancing prosperity of our Society, at our happy yearly reunions, and especially at the last exhibition. It is a good thing after the harvest is ended, to come together and display the productions of the soil—to exhibit the improvements made and the success of experiments—to create a general emulation—to learn and teach one another. Men comprehend quicker by practical examination, and are more ready to try the suggestions of science where they have the testimony of experience. They go home from these exhibitions with new ideas and increased zeal; they go home pleased and rejuvenated, because in the fruit of their labor they reap the highest enjoyment; they have learned something in the midst of recreation; they have appreciated the "*utile cum dulce*."

THE EIGHTEENTH ANNUAL EXHIBITION,

Was held in the village of Hempstead, September 15th, on ground admirably arranged for the purpose. The entrance was free from all raree-shows or clap-traps, commonly resorted to for raising the receipts. No trials of speed, were permitted by the judges in the horse ring. The char-

acter of our Society has not been lowered or its usefulness lessened, by encouraging any spasmodic effort for effect.

Over the entrance into the tent, was the following Scripture motto: "AND THEY TOOK OF THE FRUIT OF THE LAND IN THEIR HANDS * * AND SAID, IT IS A GOOD LAND WHICH THE LORD OUR GOD DOTTH GIVE US." Deut. 1. 25. Under this motto was a basket of fine fruit, and on each side of it a sheaf of wheat, while surrounding the whole was a festoon of evergreens. A more appropriate and tasteful entrance piece, for such an occasion, can hardly be imagined. The whole of the decorations were of a superior character, and reflect great credit on the decorative committee, especially the ladies of Hempstead.

Ex-Gov. King, Hon. Wm. T. McCoun, and other old friends and officers of the Society, were present. A very practical and interesting address on the Physical, Intellectual and Moral Value of Agriculture was delivered by Wm. H. Onderdonk. Ex-Gov. King spoke a few appropriate and eloquent words in support of the State Agricultural College, which he hoped the people of Queens would be prompt to appreciate and strengthen by their confidence and contributions.

The exhibition of cattle included, as a prominent feature, thoroughbred stock. Dairy cows, the exhibition was excellent. L. Rushmore exhibited one cow which had given twenty-seven quarts of strained milk in a day; and his dairy cows, averaging twenty quarts each, received the first premium. Horses excelled any previous year, consisting of the following stock: Ethan Allen, Toronto Chief, Sontag, Flying Cloud, Almack, Abdallah, Hamiltonian, Messengers, William Tell, Dixon's Tell, Vermont Black Hawk, Long Island Black Hawk, Cassius M. Clay, Morgan, Jupiter, Mambrino, Bellbrino, Belfounder, Eclipse, Trojan, Trustee, Ocean, and Plow Boy.

The other departments of the exhibition were excellent. At the winter meeting there was a good show of grain and dairy products. Wheat raised at Hempstead weighing 64 lbs. to the bushel; oats, 36 lbs.

STATEMENT OF JOHN A. BEDELL, HEMPSTEAD, CROP OF OATS, 1859.

Soil, black loam with gravelly subsoil, being originally part of the Hempstead plains. Land the previous year in corn, and a small part potatoes, manured very lightly.

This year about twenty loads of coarse barnyard manure, each weighing about 1,500 lbs., was spread on the lot and plowed under. The contents of the lot by survey is one acre, two roods and eighteen perches. Five bushels of seed oats were sown broadcast on April 1st, harrowed in, and sowed over with grass seed. Harvested by cradling on the 1st of August, thrashed with a machine, and cleaned in an ordinary fanning mill; yield, 78½ bushels, averaging 36 lbs. per bushel.

Value of oats and straw,.....	\$52 12
Expenses:	
Manure and spreading,	\$20 00
Plowing, sowing and harrowing,	3 00
Cost of seed,	2 50
Interest on land and harvesting,.....	10 00
	<hr/> 35 50
	\$16 62
Fifty per cent of the cost of manure credited to grass crop,	10 00
Profit,.....	<hr/> \$26 00

The grass looks fine this fall and will mow well next year.

JOHN A. BEDELL.

RENSSELAER.

The Address of the President, L. Chandler Ball, gives a full history of the Society's proceedings for the year, and contains many valuable suggestions, and extracts are given.

This is the Eighteenth Annual Meeting of the Rensselaer County Agricultural Society, and the opportunity is again presented of calling your attention to its condition and prospects.

The past year has been one of prosperity to the farmer, and to those branches of industry which are specially connected with agriculture. The promise of seed time and harvest has been fulfilled, and the year crowned with blessings, which call for our devout acknowledgments "to God the gracious Giver."

Since our last meeting the Society has been called to mourn the loss of two of its earliest friends and most efficient officers, in the death of Joseph Hastings, of Brunswick, and B. B. Kirtland, of Greenbush.

Mr. Hastings took part in the organization of the Society in 1841, and was its first President.

Mr. Kirtland was President in 1851. Both were earnest and efficient friends of agriculture, and both belonged to that class of men to whom the faithful performance of social and christian duties

"—— yields

A thousand sacred sweets,
Before they reach the heavenly fields,
Or walk the golden streets."

On the 8th day of May last, the principal buildings belonging to the Society were destroyed by fire. As the location of the fair grounds at Lansingburgh was given as a reason why the manufacturers and mechanics of Troy have not contributed more largely to the support of the Fairs; and as the same cause withheld many farmers from exhibiting their stock and produce, the fire was hardly extinguished before a desire was expressed that the opportunity should be embraced to procure a more satisfactory lo-

cation for the future use of the Society. A committee was appointed to ascertain the propriety and feasibility of a removal; which committee, after a full examination of the subject, reported unanimously in favor of a permanent location in the city of Troy. That report met with no response from members residing in Troy, and was, without discussion or comment, laid upon the table, where it still remains.

A favorable opportunity was thus lost for initiating a movement for making Troy the permanent headquarters of the Society, and the place for holding its Annual Fairs.

An application was then made by the people of Greenbush for the holding of the Fair for one year in that town. This application was of such a character in regard to the number and intelligence of the applicants, and their liberality in subscribing to the expenses of the Fair, that it could not be refused without the risk of alienating the whole southern portion of the county. The application was therefore accepted, and the Fair held at Greenbush, in the confident belief that the best interests of the Society would be promoted thereby—first by producing a gratifying exhibition of the products of the county, and second, by an equally gratifying display of good feeling, generous rivalry, and earnest devotion to the objects of the Society by which all parts of the county would become united in the support of all future Fairs wherever held.

It was believed, that under the circumstances, a visit to the country would strengthen the Society and increase its funds; and it was confidently predicted that on the verdant turf, amid waving corn fields and odorous orchards, by old forests and singing brook, the Society would take in draughts of invigoration which would enable it on its return to the city, to discharge with better effect and higher appreciation, its important duties.

It is due to those persons who faithfully endeavored to produce this result, that the causes of failure should be fearlessly stated, and the responsibility placed where it belongs.

First: A large number of the officers of the Society utterly neglected to perform the duties which their acceptance of office imposed upon them. The monthly and special business meetings were almost always without a quorum, and the whole burden of preparing the grounds and buildings, of receiving and arranging the articles and animals entered for exhibition, and all that supervision necessary for the convenience of both exhibitors and visitors, devolved upon three or four individuals. The labor of these men was arduous and incessant.

The loss by improper entries and admissions, which in the multiplicity of duties it was impossible to prevent, is estimated at one hundred dollars, and the extra expense growing out of a want of that assistance and advice which the officers are expected to render, amounts to at least as much more.

No public enterprise can be successful, or produce satisfactory results, unless all those persons who are trusted with its management work faithfully and unitedly to secure the end proposed; and the man who permits himself to accept an office without possessing the ability and the disposi-

tion to discharge its duties, insults those upon whom he throws the burdens he undertook to bear, and injures the cause he was chosen to advance and defend. In those enterprises which depend upon voluntary contributions and gratuitous labor, care should be taken not to require too much from any individual. Improper exactions will alienate from the Society in a single year, those who would otherwise be its life-long friends and supporters.

Another cause of failure, and one which it becomes the Society seriously to consider, was the refusal of the mechanics and manufacturers of the county to exhibit their goods and wares, and unite with the farmers to support the institution and make the Fair successful.

I have thus far spoken of the Fair as a failure—in the sense in which it has been considered, it was so. It certainly failed to produce the happy results which were hoped and expected from it. The Society has, been weakened, not in funds only, but, what is of vastly more consequence, in the diminished interest with which it is regarded, and the lessened zeal with which its duties have been performed. Nevertheless, it would be unjust to the stock breeders, farmers, gardeners and florists of the county, and especially to the people of Greenbush, not to admit that the exhibition was highly creditable to the intelligence and enterprise of the exhibitors, and that but for the inclement weather which prevented a satisfactory display of the fruits, flowers and vegetables, the exhibition would have been more than usually attractive, and as an *agricultural* Fair, may be justly called a success; and I hazard nothing in saying that if the weather had been propitious, and the officers of the Society had all acted with becoming zeal, the receipts would have considerably exceeded the expenses.

It is easy now to see the exact position of the Society, and just as easy to determine what shall be its fate. If the Society should make its Fairs strictly agricultural, and hold them at some convenient point in the county, the display of stock and farm produce would always be large and of the most gratifying character, and so far the success of the institution rendered certain. If the Society should encourage manufactures and the mechanic arts, and hold its Fairs in Troy, the exhibitions would be of the very highest order, and easily sustained. Unfortunately, the Society has been placed between these two interests without obtaining the hearty support of either; and has simply illustrated the fable of the ass between two bundles of hay, which starved while endeavoring to decide which to eat.

While an agricultural fair can be easily supported in the country, and while a mechanical exhibition could not fail of success in the city, the means of the Society have been expended in fruitless efforts to unite these industrial interests for the benefit of each, and the advantage of all the business operations of the county. The question now is, shall these efforts be continued without some better assurances of success than we have yet received? If no response shall be given to the efforts now being made to re-unite the industrial departments of the county under the auspices of this Society, then further action will be useless, and the Society should be left

to die in peace, without these painful exhibitions of decline and approaching dissolution. But if this shall prove to be only a case of suspended animation which a few stimulating applications will restore, then every friend of progress will rejoice in the results, and aid in placing it beyond the reach of similar disasters.

No one doubts that our true policy is to unite in one association all the industrial interests of the county, and hold its annual exhibitions in the city of Troy.

In manufactures and the mechanic arts, Troy alone can furnish an exhibition of the very highest order. It is only for want of that advertising which public exhibitions afford, that the extent and excellence of its manufactures, and the skill and worth of its artisans are not better known.

Cheapness and rapidity of travel and transportation, tend to the centralization of trade in the great cities of the seaboard; and Troy, whose present position and prosperity were achieved by the intelligence, the skill and the enterprise of her merchants, must now be sustained and carried forward by her manufacturers and mechanics.

It cannot be long before a Mechanics' Institute will be established in Troy; a noble hall erected, and filled with specimens of all the implements, machinery and designs which genius has invented and skill produced. To such an institution agriculture is naturally allied, and will flow *from it* to clothe the field and fill the granary, which only the dew and the sunshine will surpass. *To it* will tend an increasing demand, which will stimulate discovery and abundantly reward the successful inventor. Farmers will cheerfully encourage a movement to establish a Mechanics' Institute, and provide for a library, a museum, and a lecture hall; and when the sons and daughters of toil hold their annual festival, to exhibit the trophies and recount the conquests of labor, the farmer will present the results of *his* toil, and add to the jubilant hymn *his* song of Harvest Home.

The first step towards such a consummation is to locate the fair grounds in Troy, and to provide by the erection of suitable structures, for the artistic display, convenient examination and safe keeping of every article in the production of which the industry of the county is engaged. A plan of such grounds and structures, with specifications and estimates is now before the Society. It is hoped that this project will receive the favorable consideration and cordial support of all the business men of the city and county; it cannot be undertaken with any hope of success, without the earnest and determined support of all the friends of industry; and I am sure I do not misrepresent the farmers when I say, that while they are in favor of uniting with the manufacturers and mechanics in the support of this Society, and in favor of holding the fairs in Troy, yet if no union can be effected, if the fairs are to be limited to the exhibition of farm and household products, then they should and will require them to be held in the country, or rather, Farmers' Clubs and Town Fairs will take the place of this Society and its exhibitions.

But it is believed that a Society which has existed eighteen years, and

expended \$40,000 to promote the success of agriculture and its kindred arts, will not be left to die for want of that encouragement which those who are interested in its existence are bound to furnish.

The connection and mutual dependence of all industrial pursuits is apparent—any addition to the profits of one, will increase the prosperity of every other. An appeal to all classes and professions is therefore entirely proper. Aid to this institution may be classed among those acts of *enlightened selfishness*, which, while they sustain works of public utility, result in local prosperity and individual gain.

Your attention is solicited to the fact that the Society has commenced the collection of an Agricultural and Scientific Library; and you are earnestly invited to assist in filling these shelves with books, magazines and designs, appropriate to the purpose for which the collection is made.

The Society has been subjected to great loss by the illegal transfer of members' tickets of admission to the fair grounds. This fraud can be prevented by the substitution of single tickets to be given up at the gate; a measure which the State Society has been compelled to adopt for similar reasons.

In retiring from the Presidency of an institution with which I have been in some way connected ever since its organization, I cannot permit myself to doubt that it will be reinstated in the best regards of the people, and receive such support as will enable it to become an efficient helper in the industrial enterprises which characterize our age and people.

ROCKLAND.

The exhibition of the Society was well attended, and gave encouragement to the friends of the Society to renew their efforts for the advancement of agriculture. In the stock department the display was good, including some of the best blooded animals in the State. Much more interest is being felt in the county in improving the breed of horses, and the exhibition showed that efforts in this direction are successful. The samples of grain upon exhibition gave evidence that the yield per acre of the crops of oats, rye and Indian corn, are quite up to and even more than the average production of the State. An increased interest is being manifested in cultivating root crops; and specimens of Swedish turnip, mangel wurtzel and carrots were very satisfactory. In the other departments, including the ladies' needle work, &c., the exhibition was very attractive, and efforts will be made for the ensuing year by extending the list of premiums to increase the interest in the annual exhibition.

ST. LAWRENCE.

Since the organization of this Society, the improvement of farm stock in this county has been great and striking. In cattle and horses this improve-

ment is more particularly worthy of notice. Less attention is paid to sheep than formerly, and especially to the Merinoes. The larger, coarse wool sheep are growing more in favor, not only as more hardy and better able to resist our climate, but, as better for the table, as more prolific, and as yielding a fleece well adapted to the farmer's own domestic purposes. The raising of wool for exportation, or as the leading object of sheep husbandry, may be considered as practically abandoned in this county.

With the increase of our dairy interest, increased attention has been given to swine. The Suffolks have been bred, for a few years, with our larger and coarser breeds, and the product is a hog easily fattened, smaller in the bone, of a more delicate skin and producing solid and handsome pork. The usual weight at fifteen to eighteen months, is from 280 to 350 lbs., requiring, beside the dairy refuse, but very little grain. There still remain, however, not a few farmers among us who require, on "butchering day," two extra men and a dog to chase down their "fat hogs," and when slaughtered, these animals having consumed the refuse of the dairy and all the corn, peas and potatoes the farmer could raise, have simply attained good running condition, and make meat, not pork, fit only for the consumption of patent sausage machines. The Society has done all in its power to change this aspect of things, and it is pleased to report that small, but steady improvement is manifest. The greatest improvement, however, is in the product of the dairy and in cattle.

From the address of the President, Hon. C. T. Hulburd, it appears that the *profits* of the dairy in this county, are estimated to have been augmented by the influence of this Society, two hundred thousand dollars per year.

There were upwards of *one hundred dairies* which exhibited their products at our fair in September, and without exception, the packages were in clean, handsome and marketable order; and the products themselves were so uniformly good, that a large committee were engaged constantly, without hindrance or interruption from spectators, until the middle of the last day of the fair, in determining what articles should be rejected from the first class, as this Society pays no second class premiums on butter and cheese.

Of cattle, the Devons, Durhams and Ayrshires, are more or less bred in the county. Mr. Orvis, of Massena, exhibited a family of fine Durhams; Mr. C. L. Shepard, of Norfolk, some good Ayrshires, and quite a number of farmers exhibited beautiful Devons and Devon grades.

These three breeds of cattle, and the "natives," have been exhibited on our grounds for the last eight years, and the result is, that the "pure natives" are now rarely exhibited. Neither the Durhams nor the Ayrshires have materially extended their numbers, while the Devons are getting to be from the least the most numerous class exhibited. This, result, whether right or wrong, has been effected in great part, no doubt, by our exhibitions, where premiums have been awarded on best lots of five cows, best steers and best oxen, in which classes, made without reference to blood,

the Devons have had marked success. Probably, however, besides their acknowledged hardihood of constitution, and beauty of color and form, their decided superiority for working oxen, as exhibited on our grounds, has been a great cause of their increasing favor. The cows and oxen, full bloods and grades, which have been exhibited by the Messrs. Alanson Clark, E. Clark, and Truman Barnes, of Canton; by Mr. Reuben Nott, of Rossie; by Mr. Dike, of Depeyster, and others, have done not a little to bring them into favor,—and especially the working oxen exhibited by the Messrs. Clark, which, weighing 4,000 lbs. and 5,000 lbs. per yoke, respectively, taught our farmers the merit of the breed, both for the yoke and the shambles.

In the address of the President, our farmers were particularly urged, that each person select the breed which may please him, and devote particular attention to that breed alone, not only as containing a principle of success and truth in its general application, but because it is clearly apparent at the fairs of this Society, that *such farmers only*, are able to exhibit stock generally worthy of commendation.

There is, in this county, a very large number of horses, and much attention has been paid to the rearing of the best breeds, within the reach of our farmers. For some years past, the tendency has been to the breeding of what the officers of the Society have considered horses too small for all work; but this tendency seems now to be checked, and instead of horses too short at both ends, and too low in the middle, we shall hope for animals of more size and elegance.

This Society having made the first formal application to the State Society for one of the Arabian horses—publicly reported as likely to be presented to that Society by the Hon. Wm. H. Seward—would urge the importance of their application, should the State Society be in a position to favor it, and in this connection would refer to the probable interest already excited among our farmers on this subject. The improvement made in horses since our organization, we apprehend, is more the result of care in rearing and developing individual animals, than the improvements of blood; hence, we have occasion to fear that our improvements will not prove permanent or lasting, unless we can add also the acknowledged merits of a superior breed.

The county of St. Lawrence contains, at this time, nearly twenty-five thousand horses—more, by far, than any other county of the State—and, as there are no cities in the county, this large number is mostly in the hands of farmers. The magnitude of this interest, its value, and the great good to flow from even a slight percentage of improvement, by elevating its blood and character, will at once be seen and appreciated by the State Society. Hence I have taken the liberty to refer to our application in this report.

Our farmers are increasing their production of fruit; and more marked attention has latterly been given to the field culture of roots and vegetables. This culture has been greatly extended by the example of Mr. John White,

of Lisbon, who has exhibited from one to two hundred varieties of splendid vegetables and seeds at our annual fairs, for several years. His success and exhibitions have induced others, until our fairs, in this department, are very fine. The potato crop of the county was large and, we are pleased to report, much finer, and more free from the rot than for many years.

The wheat crop was good for the breadth of ground sown, but corn did not mature. Oats, both in the straw and the grain, were very fine. The hay crop, which is here of the utmost importance, was reported light and apprehensions are entertained that the county will suffer for forage. The failure of the corn crop adds to this probability; but the heavy growth of straw, the strict and economical feeding of stock practised by our farmers, and the general housing and stabling of our animals, it is hoped, will mitigate this evil.

Among the modes practised by this Society, to improve objects of domestic manufacture, besides the payment of premiums, the Society has published and distributed the recipes of its successful competitors; and in like manner, it has turned the attention of its members, not only to the comfort and benefit to be derived by their stock from stabling, but to its economy in the saving of manures, and to the well established fact, that in this climate, there is a saving thereby of one-third in the consumption of forage. He is here justly regarded a poor farmer, who does not stable and house his stock in winter; and, as a consequence, our farm buildings, houses, dairy-houses, barns and stables, will not suffer by comparison with other parts of the State.

By our immediate and direct connection, by rail, with the Boston and New England markets, and also with New York, we are presented a choice of marts, and the consequence is a steady and remunerative demand at our door; for every product which will bear transportation; while, indirectly, our lands are greatly enhanced in value, are far more desirable and marketable than before, and our farmers and their farms present every appearance of industry, thrift and prosperity.

H. G. FOOTE, *President*.

SARATOGA.

The past year has been one of great prosperity to the Saratoga County Agricultural Society. The arrangement whereby the annual fairs were located for ten years at Mechanicville, ended with the fair held in September, 1858; and, after a number of meetings of the executive committee a proposition to locate for the ensuing ten years, at Saratoga Springs, was made and accepted. Through the exertions of Oscar Granger, Esq., an ex-President of the Society, residing in the town of Saratoga Springs, a subscription of about \$2,500 was secured in that town and vicinity, which was expended mostly under his superintendence in fencing a field of eleven acres, south-east of and adjacent to the village, and erecting buildings for the accommodation of the fairs of the Society during the next ten years.

The Society now has secured for its use, therefore, for ten years, beginning with the year 1859, a fine level field of ten acres, upon which is erected a small two story building for the use of the Secretary, Treasurer and Executive Committee, a large Mechanical and Agricultural Hall, two stories high, forty feet wide, by one hundred long; and a Floral Hall, one story high, twenty-four by sixty feet, together with fifty covered and enclosed stalls for horses, and numerous pens for cattle and sheep.

These accommodations are double the size of what had heretofore sufficed for the Society's fairs; but the articles entered at the fair held there last September, crowded them to their utmost capacity, and it is expected that measures will be taken before the next fair is held, to enlarge them very materially.

In regard to the fair of 1859, I may say, without hesitation, that it was a great success, and gave satisfaction to all the friends of the Society. The show of horses was the leading feature, and was large beyond all precedent, whilst almost every other department was full enough to give perfect satisfaction.

E. J. HULING, *Secretary.*

SCHOHARIE.

The yield of winter wheat, twenty bushels, no disease, and a perfect success as in olden time. Spring wheat, also, was of good quality and yielded fifteen bushels per acre. Corn about two-thirds of a crop, owing to spring and autumn frosts. Rye, twenty-five bushels; barley, thirty bushels; oats, first quality, fifty bushels, one-third better than usual; buckwheat, fine crop, injured some by frost; potatoes of excellent quality, one hundred and fifty bushels, double the yield for some years past—no disease. The other crops less than usual. Drained lands are much preferred for crops, and more draining has been done this year than for ten years previous.

The general condition of farming is improving; a perceptible advance has taken place the present year in every department of farm husbandry.

J. GEBHARD, Jr.

SCHUYLER.

The exhibition of the Society was a successful one. Horses and cattle were superior to any previous exhibition. Durham and Devon cattle of choice quality, showed the increased interest among farmers in rearing good stock. The other departments were all creditably represented.

At the winter meeting, the following premium crops: corn, one acre, 169½ bushels of ears. Barley, three and a half acres, 132 bushels. Oats, six acres, 450 bushels, seventy-five per acre.

SENECA.

In making my annual report I have but little to communicate with regard to the state of agriculture in this county. That improvements are constantly making in every department of husbandry, and that there is a constant increase in the agricultural wealth of the county, are sufficiently evident to satisfy every one who pays any attention to the progress of our agriculture; and yet the movement is so gradual, that it is not easy to note the influences through which this improvement is effected, or even those which have been most influential in effecting a general improvement.

The most marked feature in the work of improvement in this county, is draining. I am not aware that the land in this county requires the aid of drainage to increase its productiveness any more than in other counties of the State. The surface of the county is diversified in its character. A very considerable portion of it lies between the Cayuga and Seneca lakes, and the ground attains, in some parts of it, an elevation of 700 feet. But notwithstanding this elevation, which apparently would, as the distance between the lakes is no where, in this county, more than fourteen miles, very effectually drain all the surplus water, such is not the case. The descent is most rapid in the immediate vicinity of the lakes, and there is a central plateau extending through a considerable portion of this county, where both surface and underground draining are necessary to remove the excess of water, which prevents the early cultivation of the ground in the spring, and greatly impairs its productiveness. The northern part of the county is level, and there are few farms in it which would not be largely improved by draining.

Improvements in this county, in the way of underground draining, are of comparatively recent origin. Surface draining had, as a matter of course, been more or less resorted to, to free the earth from superfluous water; but previous to the movement made by the Hon. John Delafield, to introduce underground draining, very little had been done to improve the farms in this county, in this respect. Mr. Delafield was the means of introducing into this county, the first machine used in the making of tile. It was, I believe, made in England, and imported here at considerable expense, and, compared with machines now in use, was not an efficient or valuable machine, although then it was a decided improvement on the mode heretofore adopted to manufacture tile. The introduction of this machine, by cheapening the price of tile, and increasing their quantity, has stimulated invention. A machine has been constructed in the village of Waterloo, in this county, which is warranted to make 2,000 two inch tile per hour, and is in every respect, a superior machine, and cannot fail to extend largely the manufacture of an article so essential to the farmer, and which is contributing so largely to increase the productiveness of the lands of this State.

John Johnston, Esq., of this county, residing in the immediate vicinity of Seneca Lake, has resorted to underground draining more extensively, perhaps, than any other farmer in the county, and with the most beneficial

results. He has almost been a pioneer in the work of improvements of this kind, and numbers of others are rapidly following his lead.

C. SENTELL, *Secretary*.

SULLIVAN.

The early frosts very seriously injured fruits and vegetables, and the crop of corn suffered severely. In some portions of the county this crop was almost entirely cut off. The exhibition of the Society was about equal to former years. Sheep, fine wool, long wool, and South Down, surpassed any previous exhibition.

TIOGA.

The exhibition of cattle showed a striking contrast to the first exhibition of the Society. Then, scarcely a full blooded animal—now Short Horns, Devons and Herefords, were represented by superior animals, and a Jersey Bull was exhibited, valuable for the dairy. Fifty yoke of oxen and steers were brought out by a town premium of \$20.

Great pains have been taken to improve the dairy cows of the county. Necessity has driven very many of the farmers to dairying on account of the wheat insect, which has rendered wheat growing unprofitable. It is not uncommon to see a dairy from ten to forty or fifty cows, where there used to be only enough kept for family use of milk and butter. If a farmer was so unfortunate as to make a firkin or two to spare, he would have to take it from ten to thirty miles to sell, and get store trade at that. The price averaged about a York shilling. Now, by means of the New York & Erie railroad, we are able to get for the same quality of butter, about 25 cents, on an average.

The miscellaneous departments of the exhibition were all creditably represented.

TOMPKINS.

The county of Tompkins had in 1855, a population of 31,516, of whom 21,795 were residents of the farms, and 9,721 residents of 18 villages. Ithaca, the county seat, containing 4,908; 5,088, are classified in the census as farmers, 1,885 as mechanics, and 503 as laborers, making a total of 7,376 producers in a male population of 15,590, or about one half. This shows a large proportion of non-producers, too many of whom are mere drones in the great social hive.

The county contains 205,616 acres of improved, and 84,963 acres of unimproved land, making a total of 290,579 acres, owned by 4,765 persons, which, if equally divided, would give about 61 acres to each.

The estimated cash value of all the farms in the county, was \$11,656,054, or an average of \$40 per acre; stock, \$1,581,130; tools and utensils,

\$379,635, making a total of \$13,616,819, or an average of \$2,648 for each of the 4,765 land owners.

We have no data to determine the actual interest that each land owner has in the soil, stock and implements of the county. It is satisfactory however to know the least of them are above want, and by a skillful application of their labor to their soil, can secure an independence by far more ample than is at the command of the landless members of the community.

If by a division of our largest farm homesteads among the sons of our farmers until the farms were reduced to the standard of fifty acres each, and the exodus of our most enterprising young men arrested and their talent and enterprise devoted to the improvement of their paternal acres, we should soon see the productive capacity of the soil doubled, trebled, and even quadrupled. A more pernicious practice however is prevalent among us. As our farmers accumulate wealth, they too frequently use it to buy up the smaller farms and parcels of land in their neighborhood, and thus crowd out the small proprietors who emigrate to the more fertile west, to reinvest their little means in larger parcels of land. This practice, and the migration of our farmer's sons, has kept our population stationary, or nearly so, for the last thirty years.

Prior to 1830, we had a steady annual increase in our population. From 1830 to 1835, the increase was 1,463; from this period to 1840, there was a decrease of 60; from 1840 to 1850, there was a small increase, and brings us up to the maximum of our population which was at that period 38,168, inclusive of the town of Hector, or within our present limits, 32,694. The census of 1855 shows that we had decreased in population to 31,516, showing a loss in the five years of 1,178. This draft upon our population, mostly to the west, was partially checked by the revulsions of 1857, and we may reasonably look for the next census to show an increase in our numbers.

The general intelligence of our people is attested by the fact that in a population of 31,516, there are but 271 over 21 years of age, who cannot read and write, and of those 173 can read but not write; and we are proud to reflect that no other county in the State can show a higher standard of intelligence among its population.

These facts lead us to look forward with renewed confidence to the farmers of Tompkins, to keep pace with their brethren of the Empire State, in whatever tends to improve their agriculture, and elevate the standard of their profession to the exalted position that their importance in society so justly entitles them.

The season, as a whole, may be regarded as a prosperous one, though not the best adapted to all crops. The frosts early in June, and the low average temperature of the month, was disastrous to the corn crop, and injured wheat and fruit in some localities in the county. The frost the 12th September, blasted the prospects of many farmers who confidently looked for fine crops of corn.

The average temperature of the season taken at an altitude of about 250 feet above the surface of Cayuga lake, was as follows :

	7 A. M.	12 M.	9 P. M.
April.....	37½°	51¼°	41°
May.....	55¾	72	57
June.....	58½	71	60
July.....	65	80	67
August.....	62	78	68
September.....	54	66	57
October.....	41	51	44

It will be observed that at noon, the average of June was one degree colder than in May at the same time of day. This is attributable to several cold days, as follows :

	7 A. M.	12 M.	9 P. M.
June 4.....	42°	44°	40°
5.....	42	59	42
9.....	52	63	55
10.....	57	46	44
11.....	43	58	44
17.....	58	68	59
18.....	54	69	54
22.....	58	69	57
23.....	56	78	64
24.....	59	70	64

The intermediate days were warmer, but the above was sufficient to check the growth of the young plant to an extent that it did not recover during the two following months.

CROPS.

Wheat, our formerly much cherished staple, has again cheered the hearts of our farmers with hope that the days of the golden harvest would once more return to bless the toil of the husbandman in old Tompkins. The breadth sown was not large and has not been since the ravages of the midge became so generally destructive. What was sown, was generally good, the berry plump and heavy. Our farmers could exhibit as fine samples of wheat as in olden times, and we have frequent instances of fields of several acres reaching an average of 30 and 35 bushels. Very little injury was done to either the spring or winter crop, by the midge.

The average per acre of spring wheat was about 15, and the winter wheat 18 bushels per acre, and the aggregate crop of the county about 150,000 bushels.

Rye is not a favorite with our farmers, who in general think they can raise more wheat per acre than rye. The quantity sown seems to be falling off from year to year, and has become so small as to hardly deserve notice. I should doubt the crop exceeding 10,000 bushels the past season.

Corn, unquestionably our most important crop, has encountered its worst enemy, at both ends of the season. The frost on the 3d of June, followed by another a few days later, injured the crop generally, and damaged it severely in many localities. This, with the prevailing low temperature of the month, checked its growth to an extent that it had to make a heavy draft upon September for ripening, which was dishonored on the night of the 12th of that month, and the crop was well nigh a failure.

The measure of ears, perhaps, would be as large as the crop of 1858, but a much smaller portion would shell sound corn; I must, therefore, reduce the average per acre to thirty bushels, and the aggregate crop to 350,000 or 400,000 bushels.

We had many crops, however, that escaped injury from the frost, and I can instance my own crop as averaging fifty bushels per acre for twenty acres.

The fodder was much injured by the frost, causing a loss that is severely felt, the more so this season, as our hay crop is far below the average. The crop would not probably exceed 25,000 tons good fodder, but it is disposed of with more economy than usual, by the increasing practice of passing it through the cutting machine before it is fed.

Barley was less generally sown last year than the year previous, though the quality was better. I estimate the average product at twenty-five bushels per acre, and the aggregate of the crop at about 50,000 bushels.

Oats are increasing in popularity with our farmers, and the quantity in cultivation has increased in the ratio that barley and rye has diminished, and this year the quality has been very superior; the grain will probably average ten pounds per bushel heavier than the crop of 1858, and I am led to believe it reasonable to put the average product at thirty bushels per acre, and the crop at 1,500,000 bushels. Many of our farmers are in the habit of sowing their winter wheat on oat stubble after preparing the ground with one plowing; or, as a rotation, they will break up a clover lay, plant it with corn, sometimes with manure, but more frequently without. Sow oats the next spring, and wheat in the fall, seeding with clover. This ground will then be pastured or mowed, or both, for one or two years, and perhaps a crop of clover seed taken off, when it will be again plowed for corn. Thus is taken three exhausting crops in succession—corn, oats and wheat, alternated with two or three crops of clover. I am led to question the possibility of being able to sustain the fertility of the soil under this system, without liberal manuring.

Buckwheat.—The general alarm caused by the June frosts for the maturity of other crops, led to the sowing of a much larger breadth of this grain than usual, and with a favorable season for ripening, the crop would have been immense; but, unfortunately, the September frost checked its filling and the grain was light, though the aggregate is probably somewhat larger than the crop of last year, and I shall estimate it at 125,000 bushels.

Peas are little heard of in our county, and I should not know where to

look for a crop, and will venture no opinion as to the quantity grown in the county.

Beans are also much neglected, and I shall pass them without an estimate of the quantity raised.

Potatoes are a good crop with us; it may, perhaps, be called a large crop. I hear of some localities where the crop has been slightly visited with the rot, but nothing of an alarming extent, and most sections of the county are entirely free from it. The quality of the potato is as fine as in the palmiest days of that valuable root, and the quantity will probably amount to a quarter of a million of bushels.

Roots of other varieties are growing in favor with our stock men as valuable additions to their stock of food. I have an account of one crop of carrots that produced 660 bushels per acre, a crop of turnips that reached 1000 bushels, and a crop of mangel wurtzel that produced 1000 bushels per acre. For fall and spring feeding I regard those roots as valuable and worthy the attention of our farmers. We have, the last year, introduced several new varieties direct from England, that have succeeded well with us.

Hay is a short crop with us, and I think will not exceed half or two-thirds an average crop, perhaps 30,000 tons is as much as the crop would weigh upon the scales, the grasshoppers were active agents in producing this result, they made their appearance early and in unusual large quantities. I think the June frost destroyed millions of them, but we had enough left to make a short hay crop and fat turkeys.

Hungarian grass has been tried by several of our farmers, about twenty-five bushels of seed having been distributed in various parts of the county, and, as far as I have heard, has given good satisfaction.

I have the account of products reaching to four tons well cured hay per acre, and the quality of the hay seems to be entirely satisfactory to all classes of animals.

Fruit.—The crop of apples in some parts of the county was injured by the June frosts, in others and much the largest part of the county escaped this cause of injury and the crop was good. The fact of our having a good crop of apples from trees that are so grossly neglected as those of our orchards generally are, and attacked by such vast swarms of destructive insects, shows great vitality in the apple tree, and should secure from their owners better protection and culture. The display of apples at our fall fair was large, and very superior in the quality of the fruit and number of varieties, among which the Tompkins King stood pre-eminently ahead of all rivals, and received the first prize offered for the best plate of apples.

The show of pears was equally meritorious, surpassing any exhibition ever before made in our county. This fruit is commanding more interest than formerly, and many are devoting their attention to the pear culture as a source of profitable employment. The shipment of apples from our county to market the past season, was about 2,500 barrels green fruit, and seventy-five tons dried fruit.

Grapes were less abundant than last year, but better matured and far

superior in quality. I don't know that there was a peach raised in the county, the fruit buds perished during the winter. A few of the nurserymen wrested a scanty pittance of plums from the ravages of the curculio, but it was an exception to the rule; the crop may be said to have been totally destroyed by this intolerable pest, and its ravages are by no means limited to the plum; other and even hardier fruits fall a prey to its attacks; the apricot, nectarine, peach, apples and pears suffer to an alarming extent.

The smaller fruits are not much cultivated among us, except in too limited quantities in the kitchen garden.

Dairying.—I regret that I have not been able to acquire any very definite information respecting this important branch of rural industry. The display of butter and cheese at our annual fair was creditable, but not in such quantities as the importance of the subject demands. I feel warranted in reporting the dairy interest of our county in a healthy and improving condition, and know that we have dairies among us that command the highest price in market, and regret that their owners are not more public spirited in attending our fairs and agricultural meetings.

The large crop of grasshoppers that we are compelled to report, has tended to lessen the amount of our dairy products, but I am still inclined to place the butter crop at 1,500,000 lbs.

Domestic Animals—Horses.—This noblest of animals was well represented at our annual fair, there being seventy-five head on exhibition, many of which were noble specimens of the race.

Breeders are giving more attention to the improvement of horses, and find their labors well repaid in the high prices that superior horses command.

The ready market demand we have for horses, and the facilities for getting them to market, prevents an increase of the stock on hand, which, at this time, probably, does not exceed ten or twelve thousand.

Cattle.—The improvement that has been going on in this department for several years past, is continued with commendable spirit by several enterprising breeders; and the benefits resulting from it is being diffused gradually through all portions of the county. The caution, however, with which our farmers are wont to move in all improvements, is retarding progress in this matter. The too general practice of breeding from grade bulls, say half and quarter blood, when thorough bred animals are at command, at a mere nominal price for service, is of this character.

If our farmers could be induced to use none but thorough bred bulls or stallions of the breeds they preferred, a few years would suffice to bring the standard of their domestic animals up to that of the improved breeds, for all practicable purposes, and the value of the stock of our county would be doubled without any perceptible increase in the cost of its production.

The display of Short Horns and Devons, at our fair, was good, in the number and excellence of the animals; we have some animals, of each breed, equal to any in the State. The Grades were also well represented, and shows progress.

Sheep were shown at our last fair in larger numbers than for several years previous, and gave proof of the increased attention that farmers are paying to sheep husbandry. South Down, Leicester and Cotswolds were on the ground in great excellence, and several lots of Saxons and Merinoes show that fine wools are yet produced in the county.

We have not sufficient data from which to compute the number of sheep, or the amount of the last clip of wool; and the period of taking the next census is so near at hand, that we will not venture an estimate.

Swine is receiving its full share of attention; but there is a wide difference of opinion yet, as to what constitutes the most profitable hog. For several years past, the small early maturing breeds seemed to command the most attention; but every now and then the mania for large coarse hogs breaks out anew, and we hear of the slaughtering of monster porkers, which is regarded as a great feat by the victims of long legs and coarse scrofulous pork.

Poultry.—The large crop of grasshoppers, of last season, gave an increased importance to the poultry crop; and a reduction in the prices of express freight, from Ithaca to New York, gave additional facilities for sending the produce to market. This has resulted in the exportation of a large amount of poultry and eggs. I estimate that there has been 15 or 20 per cent increase in the poultry crop, which has become a large item in the profits of our farms—the aggregate market value of which, I estimate at \$120,000 for the year.

Bees. The quiet manner in which this industrious little insect hoards luxuries and wealth for man's use, after supplying its own wants, has caused it to be overlooked in the estimate of our annual crops, until our attention is arrested by the export demand for the article. I am quite sure it is not an over estimate of the year's crop, to place the figures at 100,000 pounds of honey and 5,000 pounds of wax. The demand for bees in California may lessen our next crop by reducing our stock, as I find that 200 hives or swarms of bees have already been shipped for that distant market, for which \$5 per swarm was paid on delivery at the railroad depot.

This unexpected demand for bees, will cause more attention to be paid to their culture.

The Farm. Our farmers are expending more in the improvement of their dwellings and farm buildings than in the improvement of the soil of their farms. In all sections of the county you can see new and handsome dwellings taking the place of those of a former and less refined era; the improvement in the style of architecture is marked; beauty and utility is happily combined in the dwellings that are rising in our rural districts. Barns and out-buildings are also receiving due attention, and a less number of our domestic animals are exposed to the inclemency of the season than formerly. Our farmers begin to realize that hemlock boards at \$7 per 1,000 feet, are cheaper to keep their cattle warm in winter than hay is at \$10 per ton, it being notorious that a sheltered animal requires less food than one that is exposed to the severities of the weather.

The extermination of noxious weeds, and the better culture of our crops, are matters in which our farmers are making some progress.

Drainage deserves more attention than it is receiving, and to lay out and prosecute a judicious and valuable system of drainage, requires more knowledge of engineering than the majority of farmers possess; therefore many errors will be made, or only partial benefits secured by those who are pioneers in this much needed improvement.

The Society. The Tompkins County Agricultural and Horticultural Society, is in a healthy and flourishing condition. Its last annual meeting was better attended and more animated in its discussions than has been observed for many years.

The Fifteenth Annual Fair of the Society, was held at Ithaca on the 21st, 22d, and 23d days of September, and though marred by the prevalence of a storm the day previous and the two first days of the Fair, (a cause that would have broken up the Fair altogether in former years,) we had a finer exhibition than on any former occasion. Our large hall, 50 by 100 feet, was crowded, and a lack of room experienced for the first time since the building was erected.

The display of fruit surpassed that of our State Fairs a few years since.

Vegetables were well represented. One exhibitor had 15 varieties of turnips and mangel wurtzels, on exhibition, several of which were new English varieties.

Flora was profuse with her charms and added beauty and fragrance to the festival.

The ladies of Ithaca and the county, vied with each other in the display of their rich handiwork, and their department excelled in brilliancy, as do the charms of the fair contributors.

The lower hall of the building, equal in size to the other, was equally crowded with the implements and machinery that have contributed to such an extent in lessening the dradgery of farm labor. We have not space to particularize, but we must say, that our mechanics had just reason to be proud of their department at the last annual Fair of our Society.

Out doors the interest was equally great, and the prevailing storm could dampen but not quench the enthusiasm of our stock men. There were 125 head of cattle, 75 head of horses, 100 sheep, and 30 swine on exhibition, and all of good quality, and some of surpassing excellence.

The annual address of the Society was delivered by the Hon. E. J. Richardson, of Utica, to whom the Society and citizens were indebted for a great intellectual treat. The speaker had well selected his subject, and delivered his discourse in a pleasing and popular manner. The Society's appreciation of the address, is manifested in their ardor to have it published.

Town Societies. The Agricultural Society of the town of Dryden, continues to flourish, and held a spirited Fair last fall, and it will doubtless be reported through its proper officers.

The Ithaca Farmer's Club is adding largely to its library, and has at

this time some four hundred volumes of valuable books, and is providing for its museum, having employed a skillful taxidermist to prepare a collection of the birds of the county for its use. The club has also a reading room accessible at all times to members and friends, well furnished with the agricultural journals and leading newspapers of the day.

Ulysses organized a town society and held a Fair at Trumansburgh that gave promise of future usefulness and success.

Lansing also organized a town society last summer, and held a Fair at North Lansing, but not having the data from which to give further particulars, I must leave it to the report of its proper officers.

Farmers' clubs have been organized in several other towns and districts, at which discussions on agricultural subjects are had, from which much good may be expected.

It is to be hoped that such clubs will be encouraged, and extend until there is an efficient wide awake club in each school district in the county, and that such clubs, acting in concert with the county society, will take upon themselves the duty of collecting the agricultural statistics of their districts each year, which will enable the county society to compile and report to the State society each year, an accurate statement of the farm products, and the progress of farm improvements; or, in other words, we should get an annual census prepared by the persons best qualified for such a duty, instead of a census taken at intervals of five years, by marshals whose fitness consists in their belonging to this or that political party.

An organization in every county of the State that would carry this plan into successful operation, would confer a lasting benefit on the State, and be justly entitled to the gratitude of the whole people.

EZRA CORNELL, *President.*

ULSTER.

The annual fair of this society was held on the 28th and 29th days of September last, and was in all respects the largest exhibition ever held in Ulster county. The throng of visitors present from all parts of the county, and the large and varied collection of stock, farming and mechanical implements, fruits, vegetables, flowers and fancy articles, were highly gratifying, and denoted increased interest and pride in the various branches of labor represented.

The accommodations were also superior to those heretofore enjoyed. The lot purchased by the society during the year, comprising nine acres of level and dry soil, had been well enclosed, and around the outside a carriage way or track of sufficient width had been made, affording ample room for the display of the many fine horses on the grounds, without in any manner interfering with the other parts of the exhibition. Within the track were erected the stalls for stock, and the buildings and tent in which were displayed in rich profusion, specimens of every kind of farm produce and articles representing every branch of mechanical ingenuity and skill.

The list of entries was unusually large, and numbered 125 horses, 130

cattle, 100 sheep, and so on through all the various departments of the exhibition. The various kinds of stock exhibited indicated a marked improvement among our farmers and stock growers in the raising of stock.

Among the many fine animals entered for competition we cannot fail to notice a Jackson colt, owned by Dr. Thomas S. Dawes, of Saugerties, which was much admired, and also a stallion of the Mambrino stock, bred by the late Philip Hoornbeek, now owned by Daniel I. Hasbrouck, of Gardiner, and another of the same stock bred and owned by Daniel S. Schoonmaker, of Marbletown. A stallion colt owned by Joseph F. Davis, of Rondout attracted much attention for its fine style and action. A number of pairs of matched horses were shown of superior excellence, of which a pair owned by William B. Fitch, and also a pair owned by Peter J. Dubois, received many complimentary notices from the spectators.

The large number of cattle entered embraced many fine specimens, among which a fine thorough-bred Durham bull, bred by L. G. Morris, of Westchester county, now owned by James Kiersted, Esq., of Kingston, attracted much attention, as did also a very handsome pair of working cattle of the Devonshire breed owned by Maj. Thomas Cornell, of Rondout. A pair of Durham steers, owned by Col. C. L. Kiersted, of Kingston, were also much admired for their superior qualities and training. The collection of fruit was very large, principally from southern Ulster, where more time and attention is paid to its cultivation than in the other portions of the county. The contribution of A. J. Caywood, Esq., of Modena, comprised apples, pears, grapes, &c., in all their varieties, and justly attracted the attention and admiration of the visitors at the fair. Some excellent specimens were shown by the farmers of Marbletown, Hurley, Kingston and Olive. If our farmers generally would give a little more time to the proper selection and cultivation of fruit, they would find (like their esteemed fellow-citizen, Robert L. Pell), that it is not only pleasant to engage in, but in time leaves a large balance on the side of profits in making up the aggregate proceeds of the farm.

Of vegetables an endless variety were presented, making the collection immense. Pumpkins weighing 100 lbs. and over were offered by Dr. Peter Crispell, Jr., of Hurley. Potatoes of every kind and size and apparently of excellent quality, were offered by a host of competitors.

Garden products, of every variety and quality, were exhibited in such profusion as to cause the belief among many, that the hitherto barren mountains and hillsides of Ulster had suddenly become gardens of unexampled productiveness, and the numerous specimens of butter and honey were of such fine appearance and flavor as to almost baffle the judges and spectators to discriminate between them.

In the department of mechanical and agricultural implements, could be found everything, from a "Buckeye Premium Mower," to a "Shilling Knife Sharpener;" carriages from the manufactories of L. N. Hermance, and J. T. Merritt, that for beauty of style, and elegance of finish, were good enough for royalty; harness from the shops of D. B. Stowe, of Ron-

dout, and Nichols, of Kingston, that could not be excelled for beauty of workmanship outside of the shops of New York city. Indeed, this department comprised every article in which the useful and ornamental could be combined, and presented many improvements creditable to our mechanics.

The Floral department exhibited a marked contrast with former years, and presented many beautiful specimens admirably arranged, reflecting great credit upon those ladies by whose efforts it was produced. The specimens of needlework, embroidery, &c., though not so numerous as they should have been, were highly creditable to the different contributors. Too much praise cannot be given to the ladies of our county for their many tasteful and elegant contributions which rendered their department the distinguishing feature of the fair, and especial thanks are due to those who assumed the difficult duty of comparing and deciding upon the merits of the articles, and awarding the premiums to the many competitors. From the interest manifested by the ladies at this and the previous fair, we doubt not that they will continue to assist in rendering our future fairs attractive by their presence as well as by increasing the display of the many useful and handsome articles of their handiwork.

The riding match was witnessed by an immense crowd, which lined the track, and passed off with entire satisfaction. The competitors exhibited courage as well as grace in their performances, and were warmly applauded.

The address was delivered by the Rev. Silas Fitch, M. A., of Coxsackie, Greene county. It was replete with practical and instructive suggestions, and received the close attention of the large concourse of persons who listened to its delivery. A unanimous vote of thanks was passed, and the address ordered printed. After the address, the reports of committees were read and premiums awarded.

On 10th January, 1860, the following premiums for field crops were awarded. The committee, in awarding them, were governed by the largest returns received from the land, compared with the expense of cultivation.

1 acre of hay, 1st premium,	\$5.00, to C. L. Kiersted,	yield, $4\frac{1}{2}$ tons.
2 do oats, 1st do	5.00, to C. L. Kiersted,	do 213 bushels.
1 do do 2d do	2.50, to Wm. Cockburn,	do 92 $\frac{3}{4}$ do
1 do do 3d do	Tr. Inst. to Jas. Kiersted,	do 67 do
1 do corn, 1st do	\$5.00, to Wm. Cockburn,	do 67 $\frac{1}{2}$ do
1 do do 2d do	2.50, to C. L. Kiersted,	do 68 $\frac{1}{2}$ do
1 do do 3d do	Vol. Tr. to Jas. Kiersted,	do 56 $\frac{1}{2}$ do
$\frac{1}{2}$ do potatoes 1st do	\$3.00, to Henry E. Legg,	do 120 do
1 do spr. wh. 1st do	5.00, to E. L. Thompson,	do 15 $\frac{1}{2}$ do

The average crops per acre, raised in the county in the year 1859, as near as can be ascertained, are as follows:

Winter wheat,	18 bushels.
Spring wheat,	14 do
Indian corn,	40 do
Rye,	25 do
Oats,	60 do

Buckwheat,	25 bushels,
Potatoes,	125 do
Hay,.....	1½ tons.

From the foregoing statement of its proceedings for the past year, it will be seen that our Society has never been in a more healthy and prosperous condition than at present, and its influence is rapidly extending.

Since its re-organization under the law of 1855, it has received new vigor from the interest manifested among our farmers, to become members of it and to take part in its proceedings. Its meetings have been well attended, and all its members are desirous to assist in promoting its advancement and usefulness, and to share in the advantages and benefits it confers by developing the resources of our county, and improving and promoting its agricultural interests; and we confidently predict that the future reports of the Association will be evidence of its increasing prosperity, and of the good resulting from the zealous and progressive spirit which it has infused among those who reap the reward of intelligent and well directed labor in the cultivation of the soil.

C. L. KIERSTED, *President.*

BENJ. B. HOORNBEEK, *Cor. Secretary.*

PRESIDENT KIERSTED AND HIS WORK.

The record of the doings of the Ulster Agricultural Society for the twelve months passed is full of encouragement for the future. Col. Kiersted's administration has vindicated the warm support and confident reliance upon his energies, on his election, a year ago. By dint of his personal exertions, in the main, and the impulse given to the whole body of his ardent enterprise, the association has been re-organized thoroughly, and put on a sure basis for the future. The purchase of the fair grounds, which has been regarded as impossible before this, has been completed, and save a trifling sum, has been raised and paid. No county in the State has a society better organized now, and with fairer prospects of doing a good work. The last annual meeting was a triumph. And there is small doubt now but that a career of vigorous usefulness is open in its history. Col. Kiersted has been ably seconded in his efforts; but it is a bare act of justice to say that what has been done is principally owing to his management and labors. In anything of this kind, however great may be its value and the public interest in its success, there must be some one who will not grudge his labor, nor shrink from inevitable responsibilities. And Col. R. was the man for the occasion; with a clear view of what was needed, a ready hand for the work, and no disposition to look back after putting his hand to the plow. It is not to be wondered at that the society should insist upon re-electing him to the presidency for 1860, and it is a weighty pledge that its progress will be commensurate.

A MEMBER.

WARREN.

The third exhibition of this society was a very successful one, and an advance on previous years. Although the frosts affected some of the crops severely, yet in some departments the exhibition was quite varied, and in many there were articles of superior excellence. Of potatoes there was a large exhibition. Twenty-four different varieties were shown, proving that the soil and climate of Warren are adapted to the production of all the most esteemed varieties. If farmers could be induced to keep accurate statistics of their cultivation, and present them annually with their products, then the reports would be much more valuable, and our system of cultivation would exhibit a constant progress, and the varieties, the best and most profitable would be established.

In the stock department, cattle, horses and sheep were well represented. The President, B. C. Butler, in announcing the committees, remarked that the exhibition was, in many respects, an advance of that of last year. The manufactures are from a larger area, and more varied in character. They embrace leather and tanned robes, paintings and guns, which have never been exhibited before. The produce is not equal to the best efforts of our county. We have had a frost every month in the year, which tells upon the maturing of vegetables. But, on the whole, it is a fair show; the corn has matured, and the varieties of potatoes on exhibition, were very creditable.

The census reveals the fact that, in 1855, the acres of corn planted in this county were 7,268, yielding 123,817 bushels of corn, being an average of 17 bushels to the acre. Ulster county planted 18,429 acres, yielding 242,229 bushels, an average of thirteen bushels to the acre. Also that the potato crop was 2,630 acres planted, and 173,328 bushels grown, which is an average of 80 bushels to the acre; while in Ulster, the average was 39 bushels to the acre; and in the entire State, the average was about 69 bushels to the acre.

These figures indicate a handsome average for the lands in our section. In regard to the cattle and horses, I will not particularize, except to say that, as a whole, the exhibition of well-shaped cleanly animals, is one of which we need not be ashamed. And I would submit to the farmers whether these annual fairs and exhibitions of stock are not the very best advertisement they can have for their farms. While in our neighboring counties the pastures have been parched up, this show indicates that we have not suffered to an equal extent. The fine specimens of produce indicate a fertile soil; and while 334,000 acres, or three-fourths of Warren county, are still an unbroken wilderness, we cannot mistake the work before us.

WASHINGTON.

In the report of the agricultural prosperity of Washington county for the year 1859, we are warranted in stating that it is progressive. Farms

are being better tilled and rendered more productive. Wet places are undergoing a thorough drainage, which gives them increased facilities for cultivation, producing larger crops of improved quality, affording a remuneration for the outlay, to say nothing of the beauty of neat husbandry, which is a commendable attainment of the ambitious farmer. Barren, bushy and slovenly patches are cleared up and brought under cultivation. More pains are taken in the making, saving and applying manures to enrich the soil and to fertilize and stimulate the growing crops. Buildings are repaired, or removed and new ones substituted, improved in appearance and convenience. Roads and bridges have also shared in the spirit of improvement, adding increased facilities to travel to and from markets. However, much of our surplus produce, not needed for home consumption within our bounds, is purchased at our own doors and conveyed to distant markets by our railroads and canal and lake navigation. As the population of our villages is increasing, additional accommodations are needed, not only as dwelling-houses, but as places of business, and their constant erection in modern style and enlarged accommodations is another evidence of thrift. Mechanics of good taste and skill are needed, sought and usefully and profitably employed. A variety of manufacturing interests are well patronized, requiring an increase of raw materials, labor and capital to meet the demands of their products. Organized congregations are well supplied with acceptable ministers. Commendable exertions are made to elevate the standard of education in our primary schools and also in our academies, and thereby secure a moral and an intelligent population. The dead are cared for as well as the living; during the last and present year Woodlands Cemetery, in Cambridge, has been organized, grounds purchased, laid out into lots, roads, avenues and walks graded, interments made, and valuable monuments erected to the memory of departed worth. In Salem, during the present year, a similar enterprise with noble bearing has been in progress. The foregoing operations are mentioned as evidences of progress, as they are all dependent upon industrious, thriving, farming citizens. Our sources of wealth are in the soil, from which it is to be drawn out by agricultural process, and applied in sustaining life, in making us comfortable, and in promoting the refinement and intelligence of a favored community.

The season in some respects has been unusual. The spring was cold and dry, followed with late frosts, destructive to many garden vegetables, and injurious to field crops, especially corn. The summer and autumn were visited with a severe drought, accompanied with swarms of insects, hungry to devour a scanty and withered vegetation. Notwithstanding these embarrassments many crops matured well and compare favorably with past seasons. In the northern section of the county winter wheat is cultivated with some success; and spring wheat more so, and more generally through the county, but both more or less have been subjected to the injurious effects of insects. Our principal grain crop is Indian corn, which suffered by drought and by late and early frosts, but has matured and yielded better than was anticipated. Rye is not as extensively cultivated as it has been

in former years. The growth this year has been considered better than usual, and of an excellent quality. But few farmers cultivate barley. When sown it generally pays well for cultivation. The season has been favorable for it and it has yielded a good increase. It is seldom that a heavier and better oat crop is produced in the county than the present year. Buckwheat was injured by the drought and has been comparatively light. Flax has done better. In former years it has been more extensively cultivated; and especially by the farmers in the southern portion of the county. The past season has been favorable for its growth, and the crop has been heavily seeded and thickly coated with lint. In the potato crop there has been less of disease than in some former years, with a respectable yield and of a good quality. Some new varieties of esteemed excellence have been introduced through the agency of the New York State Agricultural rooms, at Albany, as furnished in small bags by the generosity of the Rev. C. E. Goodrich, who has been doing a noble work in the improvement of the varieties, and the cultivation of that indispensable vegetable, among which is the Garnet Chili, for table use, in our estimation, is second to no other variety to us known. It is of good size, yields well, and has not as yet been much affected by disease. Farmers have been discouraged in their attempts at raising peas as a field crop in consequence of the annoyance of the bug, and but few are sown. Beans, with proper care and good cultivation, are a valuable crop. But like other vegetables they need food to live upon and thrive, and are not to be trampled down, nor over run, nor overshadowed by weeds. The product has been fair.

The drought to which we have alluded had a serious effect to diminish the crop of hay. It is estimated that it is from one-half to one-third less in quantity than the year preceding. It is of good quality, and was gathered in the best of weather. This is the heaviest farm crop of the county, and its failure is seriously felt by the growers of stock. In the cultivation of fruit there is annually a moderate advance. New and choice varieties are sought and introduced. The bounds of orcharding are enlarged and planted, furnishing a good supply for domestic use, and generally some for exportation. Messrs. H. Valentine & Son, of the Northern Vineyard, in Jackson, have experimented upon the culture of the grape. Their object has been to obtain and cultivate those varieties that will stand the rigor of our winters without extra protection, and yield their fruit ripened before the early frosts. They have so far succeeded as to manufacture from their product several barrels of wine, which is said to be of a fine flavor and a choice article. Our seed gardens show an annual advance in their improved culture and valuable product, giving a wide range to their sphere of usefulness. We have confidence, as it respects the superior varieties of garden seeds here raised, that they are unsurpassed in excellence, reflecting high credit upon our gardeners.

The dairies are distributed among our principal farmers, who, after their home supply, usually have a surplus of butter for sale. A few keep a herd of cows and manufacture both butter and cheese for market, where no

pains are spared in producing superior qualities, and not failing to command the highest prices. The butter is packed in crocks and tubs; the cheese is put into boxes of appropriate size, each one by itself, for safe transportation. The business is suitable for grass farms, and is considered safe and profitable in skillful hands. The raising of pork is also a heavy item in the product of the farm. The milk of the dairies, and the rich clover fields do much to advance its growth. This is followed with a refuse from the fields which they readily devour, and by which they are brought forward in good condition, and shut up for heavy feed on the best material. In this way our best and heaviest pork is prepared for market at different seasons, and is eagerly sought, at the best prices, for the Boston and New York markets.

In Cambridge is an establishment, with extensive accommodations, for the fattening of beeves. Oxen are purchased, stall fed, sold, and taken by railroad to places where good beef commands the best prices. This makes a ready market for the surplus of hay and grain in the vicinity, and furnishes a noble quantity of manure to nourish the heavy crops of a valuable farm.

Our County Agricultural Society has had its influence to encourage experiments in the cultivation of different soils,—the application of manures and fertilizers,—the growing of a variety of vegetables, fruits and flowers, both for the garden and the field. It has encouraged the introduction of the most approved varieties of farm stock, consisting of horses, cattle, sheep, swine and fowls. It has also encouraged every branch of human industry, as the productions of their mechanical skill may be seen on exhibition at our annual fairs, in improved implements of husbandry, and labor saving machines for the farm, the house, and the work shop,—the beautiful work of ladies, and the life-giving touches of the pencil, all combining to diffuse intelligence, to encourage experiments, to patronize art, cultivate taste, to enjoy sociability, promote industry, and refine society.

EPHRAIM H. NEWTON,

Cor. Sec. Washington Co. Agr. Society.

CAMBRIDGE, Dec. 23d, 1859.

WAYNE.

In making a report of the Wayne County Agricultural Society, for the year 1859, it seems to be as necessary to describe the condition of agriculture in the county, the crops, improvements, &c., as to record the transactions of the Society.

The farmers of Wayne are again encouraged. Naturally one of the best counties in the State for the production of wheat, and that staple and profitable product having been mainly relied on as a farm crop, its almost entire failure, on account of the midge, for a few years past, was really a cause of serious apprehension. And, although other crops were raised with more or less profit, the failure of this great staple of the county was

severely felt, and produced great depression in agricultural energy and improvement.

Imagine the agreeable disappointment of the farmer, when, at harvest, instead of receiving fresh discouragement from another ruined crop, they beheld the golden grain ripened and untouched by the depredator, bending to the earth by its own weight, and yielding more largely than of yore. The "Harvest Home" was again celebrated by joyous mirth, and hope and renewed expectations, again made strong the arm of the husbandman.

The wheat crop was never so good in the county; the average yield could not have been less than 30 to 35 bushels per acre. The variety generally sown is Mediterranean, and though still called a red wheat, it is very different from what it was when introduced here, several years since. It is now nearly equal in all respects to white varieties, its color having materially improved.

The quantity of wheat sown was larger than usual, and a strong hope is felt that the crop will again resume its former importance.

Winter barley, of which a large amount is annually raised in this county, is rapidly coming into favor as a profitable crop. The yield this season has been large, averaging fully sixty bushels per acre, and several crops under my immediate observation going as high as seventy-five. It requires the same kind of soil and culture as wheat, and never has been injured by the midge, to my knowledge. It is early, and can be harvested two weeks before wheat, a merit which farmers will appreciate.

Spring barley was not a good crop, though a large amount was sown. The average yield in this county was not far from eighteen bushels per acre. It is perhaps more liable to injury by insects than the winter variety.

Oats were heavy, excellent in quality, and the yield consequently large per acre. The amount sown was also great.

Indian corn was not as good a crop as last year, though a fair one. A large number of acres was planted, and the stalks form an important item of forage for stock.

The hay crop was hardly equal to former years, though much better than in counties west of this.

The fruit crop of the county was good, except peaches. Apples were fair and abundant. The entire product of the county may be stated as follows: which is substantially correct, though other counties that do not produce two-thirds the quantity of apples grown here, report larger yields. The price does not include barrels.

150,000 bbls. green apples shipped, 9s.,	\$168,750
60,000 bbls. do do sold and consumed, 9s.,	67,500
60,000 bbls. do do fed and made in cider, 40c.,	24,000
600,000 lbs. dried do shipped, 6c.,	36,000
Pears and small fruits,	3,750

Total fruit product,	<u>\$300,000</u>
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Although almost every farm in the county has an orchard, many of them comprising 20, 30 and 50 acres each, still, the number of fruit trees annually planted is greater than at any former time. The best varieties for profit, are the Rhode Island Greening, and Baldwin.

In planting an orchard 75 per cent of Greening, and 25 per cent of Baldwin trees are selected.

For fall and early winter use and market, we have the Billy Bond apple, which for hardiness of growth, great productiveness, fine appearance, culinary properties and good flavor, has no equal. As this apple is unknown, except in Wayne county and vicinity, I append a history and description.

THE BILLY BOND APPLE.

History.—This apple, according to good authorities, originated in France, with one William Bond, and was introduced in Wayne county, about the year 1790 by John Dirdu, a Frenchman, who called it 'Billy Bond' after its author. It is common in Wayne and Ontario counties, where it has been propagated, and where it is held in great esteem. As a market apple it stands high, bringing a higher price than others. It has been confounded with the "Belle et Bonne," "Domine," "Rambo," and "Autumn Seek-no-further," but is none of these; it being a distinct variety, not described in the books. The people will introduce it, whether the nursery-men do or not.

Description.—Size medium to large; oblong-ovate; color striped and dotted with rich yellowish red, or greenish yellow ground; quite red on side towards the sun; stripes sometimes broken and irregular; skin rather thick and smooth; stalk short and rather slender, cavity small; calix in narrow basin; flesh yellowish white, rich, mild, sub-acid, agreeable flavor; excellent for cooking, or table, very handsome; tree hardy, spreading, very productive; fit for culinary purposes in October, ripens in December, and keeps well till February or later; worthy of general cultivation.

The annual exhibition of horses was held on the grounds of the society, July 4th and 5th, and was successful, as these special exhibitions of the society always have been.

These exhibitions are designed to afford the producers of this kind of stock, facilities for showing their animals, and dealers in horses an opportunity to purchase, a mutual benefit which both avail themselves of, to their evident advantage.

At the annual fair, the show of cattle, particularly Short Horns, was excellent. Messrs. Cost and Putnam, of Lyons, have introduced several herds of pure bred Durham cattle from the best herds in Kentucky, which form a great addition to the stock of the county. Many of their cattle were upon exhibition, and elicited much praise.

The show of fruit and vegetables, was such as Wayne county and vicinity, only, can furnish.

Altogether, the fair was successful and yielded much pleasure, and perhaps profit to those who attended it. A new feature was the sale of stock

and articles at auction, in the afternoon of the last day; \$2,000 worth of property changed hands to the mutual satisfaction of both, buyer and seller.

Improvements of all kinds are steadily going forward in the county; as for instance, the erection of comfortable and even elegant farm dwellings, barns and other out buildings; fences, &c.; the introduction of all kinds of improved stock; the use of labor saving farm implements, and the reclamation of wet and unproductive lands by draining.

DEWITT C. VAN SLYCK, *President*.

WESTCHESTER.

Owing to the unfavorable weather, the exhibition was not as well sustained as usual. In some of the departments, the exhibition was very well represented. Agricultural implements were very creditable both as to numbers and quality. The general introduction of mowers and reapers, those essential aids to the farmer, has been the means of advancing the agricultural interest. The vegetable display was very creditable, and in no department has there been greater improvement than in this, and most of this advance is due to the county and town Agricultural and Horticultural associations.

On no former occasion has there been such a display in the Fruit department. Persons competent to judge who were present at the State Fair, assert that the fruit exhibited there, excelled ours only in quantity. Apples and pears, of the choicest varieties, were shown. Grapes, both native and foreign, were of great variety and excellence; and upon the whole, it is considered that, notwithstanding the unfavorable weather, the result was highly advantageous to the cause of agriculture.

WYOMING.

This Society has been in successful operation sixteen years. From its commencement, it received the support of many of the most intelligent farmers of the county, and from then until now, it has been steadily growing more and more popular with the masses. The operations of the present year have been eminently successful. The various departments of the annual exhibition were well sustained. Display of Devon cattle was very attractive, as was that of Durham's, though not as large as the Devons.

Dairying. A large part of the county is devoted to dairying. It is attracting much of the attention and capital of farmers, and cheese is one of the great staples of the county. More than usual interest has been manifested of late. In the past two years, it has realized from eight to twelve cents per pound. Great improvement is evident in its manufacture. The new patent vat, with steam for heating the milk and scalding the cheese, has been generally introduced. It is a great saving of labor, and is hailed with gratitude by all housewives. This vat, with other improvements, has given a greater uniformity in the cheese, and its quality is far better than former

years. Wyoming cheese now stands first in market in Western New York. One of the largest dairies was taken to Troy and stood first in that market.

Much of the interest is due to the competition which has been excited through our Agricultural Society. A trial of mowers, early in the season, resulted in an award to the Buckeye mower, manufactured at Dansville. The address was by Horace Greeley—his first after his return from California—and it was replete with interest and instruction.

The frosts of June have been a severe drawback to agriculture in the county. It seriously affected fruit, corn and potatoes. In the western part of the county nearly ruined the great staple crop.

Grass. Not one-eighth the usual amount has been cut.

Agricultural journals have been awarded for premiums, it is believed, with great advantage.

E. G. BABBITT, *Secretary.*

YATES.

The exhibition was one of the best and most successful ever held in the county; the attendance unusually large—more than 500 entries. The exhibition of horses, cattle, sheep, swine and poultry, was excellent, and the miscellaneous and dairy departments unusual fine. A plowing match the day succeeding the Fair, was largely attended—Scotch, English and Americans, contended for the prizes, and the English won the day.

AMERICAN INSTITUTE.

To the New York State Agricultural Society :

The Trustees of the American Institute, respectfully Report,

1. That in pursuance of that part of the objects of the Institute which has reference to Agriculture, the meeting of the New York Farmer's Club of the American Institute, have been regularly held in rooms provided for the purpose, in the Cooper Institute. At their meetings, papers have been read, discussions held, and information, drawn from sources both foreign and domestic, of no small interest has been communicated. The proceedings of the Club, so far as they have been thought worthy of preservation, will be prepared for publication in the annual volume of Transactions.

2. That in further pursuance of the same objects, an Agricultural Show and Horticultural Exhibition were held at Hamilton Park, and in the rooms of the depot of the Third Avenue Railroad. The show and exhibition were opened on the 21st of September, and continued until the evening of the 26th of September.

The following is a statement of the entries: horses 84, cattle 141, sheep 27, swine 17, poultry 203, agricultural implements 27, embracing four large assortments from Agricultural warehouses.

The Horticultural exhibition was very extensive both in flowers and fruits.

3. The American Institute did further at its annual Fair at Palace Garden, provide for the exhibition of a numerous and very interesting collection of Agricultural machines and implements, and a new stock of fruit, flowers and vegetables.

4. That in order to attract exhibitors in the Agricultural department, and reward their skill and industry, premiums of great value were offered and awarded. In dispensing these premiums, the American Institute has expended the sum of \$3,283.11.

The American Institute further reports, that the unfavorable state of the weather during the days of the exhibition, was such as to preclude any large influx of visitors, and that thus, in their anxiety to promote the Agricultural interest of the State, they have sustained a very serious loss.

It is proper that the American Institute should acknowledge that the Floral and Horticultural Shows at the depot of the Third Avenue railroad, were chiefly contributed by and exhibited under the immediate direction of the New York Horticultural Society. All which is respectfully submitted.

New York, February 8, 1860.

JAMES RENWICK, WM. HALL, B. AYCRIGG, JOHN A. BUNTING, H. MEIGS, W. B. LEONARD, JOHN GRAY.	}	Trustees.
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TOWN ASSOCIATIONS.

BAINBRIDGE.—For the purpose of awakening a more earnest interest in agricultural and mechanical pursuits, this society has opened its doors to *all* for competition, offering to compete with any and every one who may feel inclined to enter the lists in friendly rivalry. Under this new order of arrangements we find our list of entries increased greatly from any former year. The show of pure thorough-bred stock never being exceeded at any county fair ever yet held in this county. The herds of F. M. Rotch, of Otsego county, and Mr. Chapman, of Madison, were well represented by the superior animals shown by themselves, or by those who had purchased them direct. One Short Horn cow, I beg leave to notice particularly, owned by C. J. Hayes, of Otsego county, of perfect symmetry in shape and carriage, a live weight of over 1,800 lbs.; also the thorough-bred South Down bucks from Mr. Baker, of Madison county, and Mr. Rotch, of Otsego, each a model of beauty.

I will give you the present policy of many of our best farmers, and I think it the true one. For instance, in breeding, milking or beef stock, use the best thorough-bred Short Horn or Devon bulls on the best native milking stock that can be procured, thus breeding *up* continually, and with each cross infusing more and more of pure blood. The first cross gives *half* thorough-bred; the second, *three-fourths*; third, *seven-eighths*; fourth, *fifteen-sixteenths*; and at this point, for all practical purposes, the stock will be as good as thorough-bred. Under no circumstances should a farmer, desirous of improving his stock, have recourse to a grade bull, for his weak blood mingling with that of his dam gives a still weaker dash to the calf, and there is no assurance that its offspring will not "breed back," and show the poorest qualities of some of its ancestors. The same may be said and has been said in regard to horses. One dash of thorough-bred stock for certainty of breeding, is worth any number of grade crosses. No matter how symmetrical may be the form of the sire. The inflexible laws of hereditary descent manifest themselves in every case, sometimes in one generation and sometimes in half a dozen generations. The farmer, careless, or it may be, ignorant of consequences, often uses a fine looking grade bull, sometimes not even a half blood, and the result in time is that in place of improving his stock he goes back to his starting point.

FARMERS' AND MECHANICS' ASSOCIATION OF CAZENOVIA.—The committee appointed to examine farms, respectfully report, that they have examined four farms, and one set of farm buildings. The four belonging

to Messrs. Whiting, Annas, Chappell and Card, and the farm buildings belong to Levi Tillotson. The farm of Mr. Card is situated in the east part of the town, and cultivated as a stock farm, on which sheep and neat cattle are raised, with grain for the use of stock, and is in a good state of cultivation. The buildings and fences in excellent condition and nearly new, and very well adapted to the purposes for which they are used. The farm is well watered by springs, which have been greatly improved by a judicious system of underdraining, which has greatly improved the land, rendering naturally wet and even miry places fit for the various kinds of grain and grass grown on the farm. Everything about the house, outbuildings and the fences, has a very neat and pleasant appearance, and shows that there is neatness, economy and taste in the management of the whole establishment in the house and on the farm.

Mr. Whiting's farm is at the head of the lake, and is in a good state of cultivation, and is being improved by its present owner who has been on it only two or three years, and if he continues to carry out his present plans of improvement, will make it one of the most pleasant and desirable residences in the town in a short time.

Mr. Chappell's farm is in a very good state of cultivation, and well fenced; the buildings are good and well adapted to the use of the farm, and all that is necessary from the ash and smoke house to a good and well finished and furnished dwelling-house. The outbuildings are furnished with machinery for thrashing grain, making cider, sawing wood and churning butter; and last, though not least, in the estimation of the boys, turning the grind-stone. Everything about the premises show care and good management.

Mr. Tillotson's buildings are of the first class, and the house is one of the best, if not the very best farm-house in the town, and will compare favorably with the best farm-houses in any of the adjoining towns, and is well worthy of the society's first premium, which your committee most cheerfully award to Mr. Tillotson.

Mr. Annas's farm is in a very high state of cultivation, having been owned and occupied by its present proprietor for a great number of years, and by a judicious system of rotation of crops and high manuring, thorough tillage and draining, has been rendered one of the most productive farms in the town. We would call particular attention to a field of five acres, which has been reclaimed from a half cleared beech wood pasture, and made one of the most beautiful fields of wheat we have seen the present season, and makes us think of the time when the wilderness and solitary places shall be glad, and the desert shall blossom as the rose. The wood lot has been kept with the greatest care, and is one of the most beautiful in the town, and your committee consider that the farm as a whole is one of the very best in the town, but as Mr. Annas has had the first premium on his farm before in the county, he did not wish to compete for the society's premium, so entered his for exhibition only.

Your committee called on Mr. Sweetland to view his farm, but as he was very busy in superintending his building, and unable to show his farm, we did not examine it closely, but in passing over a part of it, we noticed some recent improvements, especially some very good and substantial farm gates, which are worth viewing and imitating by our farmers generally.

Your committee, after viewing the aforesaid farms, have, with entire unanimity, and great pleasure, awarded the premium offered by the society for the best cultivated farm, to Mr. J. W. Chappell.

The fair was a great success. The weather was propitious; the attendance the largest ever known; the arrangements satisfactory. A system of entry, new to this association was adopted, and gave, we believe, entire satisfaction. Articles entered for premiums were numbered, and the owners' names were not affixed until after the judges had made their awards; thus obviating any suspicion of favoritism.

FARMERS' CLUB OF LITTLE FALLS.

ROOMS OF THE FARMERS' CLUB, }
Little Falls, Jan. 5, 1860. }

DEAR SIR,—In furnishing you with our third annual report, it gives us pleasure to be able to state that our society continues to be in a highly prosperous condition.

During the past year, the semi-monthly meetings of the club have been generally well attended, and much interest manifested by members and others, to promote agricultural improvement in this section.

The same general features initiated at our organization in reference to the ends to be obtained by the association and the means best adapted for that purpose, have been kept in view, and have guided our operations during the year.

An essay on some subject relating to agriculture, has usually been read at each meeting of the club, and the subject thereafter discussed by members. These essays, with a brief report of discussions, have been published from time to time, in two of the county papers having the largest circulation in the county. It is believed that the labors of the club and their published proceedings, have been of great value to the farmers of this county, and are beginning to awaken a spirit for improved culture of the soil and better management of the dairy, which could not easily have been effected by any other means. The club from the first, has endeavored to be liberal in all its doings—to avoid sectional feelings—to accomplish all the good it could without reference to locality, and without harboring feelings of jealousy towards other societies of a similar character. Hence, persons not members of the club, have been furnished with seeds, cuttings, &c., and have been cordially invited to be present and take part in our discussions; to bring the products both of their farms and manufactories

to our Fairs, to compete for premiums without any charge being made for entering articles.

In August last, a volume was published containing all the essays and discussions before the club, up to that date. This volume was prepared for publication by the secretary of the club, and makes an octavo book of between two and three hundred pages.

During the year there have been several donations to our library. The whole number of volumes at this date in the possession of the Society, is about 100. We have recently received from the State Society, 20 volumes, being Transactions of the New York State Agricultural Society, and of the American Institute.

From the U. S. Patent Office, we have been furnished with the Agricultural Reports of that department, and also with a number of packages of seeds, which, with specimens furnished by members of the club, have been gratuitously distributed among members and others. The seeds from the Patent Office have been distributed among members of the club, with the express understanding that experiments should be made with them in order to test their merits in this locality, and with a view thereby of benefiting the whole community.

Mr. C. Oyston showed a model of a cheese press of his own invention, which elicited the admiration of members of the club, several of whom thought it would prove decidedly superior to any other press in use. Its simplicity and uniformity of action were much admired. It is what is known as a double toggle-joint press. It consists of two sectors, or parts of circles, of cast iron, which are connected to the under side of the cap timbers by means of rods or journals passing through their centers at each end of the press, while the circumference of these sections are geared and work into each other, motion being given to them by a spur gear which has on its shaft a ratchet wheel, which is operated by a lever and crank, &c. From the sectors some distance from their centers, depends two pairs of pitmans whose other ends are connected to the ends of the press beam or follower, which cause the beam to descend with a perfectly horizontal motion without the aid of guides. We understand he has applied for a patent.

HARTLAND AGRICULTURAL SOCIETY.—In presenting our annual report for the working year of the Hartland Agricultural Society, it will probably be proper to give a brief description of the town of Hartland, in Niagara county. Fifty-five years ago it was an unbroken wilderness—where wolves, deers, and other animals common to the North American forests, abounded in all their natural habits, undisturbed by the march of civilization, except when the booming shot from vessels on the neighboring lakes resounded on their forest homes.

Our town comprises a variety of soils adapted to the different branches of agriculture. The great ridge road divides it nearly in the center east and west, which is a natural gravel road equal to any artificial road in the

State. It was, according to geological reasoning, once a basin or shore of Lake Ontario, which is six miles distant. North of this ridge the land is low with extensive swamps, and wet land of about 5,000 acres, which is now being reclaimed by cutting a ditch six miles long through the town, at a cost of \$14,000, the expense of which is paid by a tax on the land it benefits. The ditch is nearly completed. Already has the work of clearing the swamps commenced, and we shall soon have hundreds of acres of fine muck meadows where now the alder and wild rose, with their associates in such localities grow in profusion, surrounded by fine tillable land, through which will flow a never failing stream.

South of the ridge, the land is high and rolling, which before the ridge made its appearance, was a fine wheat growing district.

It is well adapted to the growth of corn, oats, and grass. Barley does not produce as well as other grain. Like the rest of western New York, it yields abundance of fruit, especially apples and the smaller fruit. Pears are being extensively cultivated, although the late planted trees are not in bearing yet, which are about equally divided between standards and dwarfs. Occasionally peaches yield fruit in abundance, which is large and fair, and of fine flavor. Our cold winters render it uncertain, consequently an unprofitable crop to raise for market. Apples are shipped from this locality to New York, Boston, Philadelphia, and the western cities.

The season of 1859 was an unprofitable one for the farmer. It is seldom that more energy is displayed in putting in crops than the early spring witnessed, but the frosts later (last of June) and those early in autumn, blighted the anticipations of the farmers at the commencement of the working season.

FARMERS' CLUB OF LEWISBORO.—I will endeavor to give you a brief history of our club for the past year. Our club has numbered over forty members for the past year, and the prospects for 1860 are encouraging. There is evidently a growing interest in the club; the books that we have received from the State Society and Patent Office have been much prized by the members. There have been about eighty volumes distributed among the members during the past year. We have paid out over \$40 for lectures during the past year, and we have obtained several very valuable free lectures. Our pastor, Rev. A. L. Lindsley, gave us three historical lectures, that were very interesting, and showed deep research and study. The Rev. A. H. Seeley, of North Salem, gave us a lecture on India, their mode of agriculture, idol worship, the habits of the people, &c., &c. Henry Wood, Esq., of Bedford, gave us a lecture, in which he gave us his experience and views on the benefits of soiling cattle; he showed clearly that there was great advantage and profit to be derived from soiling, over the usual mode of keeping cattle. The lectures have all been largely attended, and have given universal satisfaction.

MIDDLEBURY AGRICULTURAL SOCIETY.—Our Society is named "The Middlebury Agricultural Society." The scope of its operations is designed

to go slightly beyond the limit of agriculture, so as to embrace mechanics and some other allied subjects. The Society, beginning in October, holds regular meetings two or three weeks asunder, at which previously assigned topics are discussed, and generally an address is presented by some member appointed at the next preceding meeting. During the current year, the meetings have constantly increased in interest and value. At the last two meetings, the twenty volumes you so kindly sent us have been put in circulation among the members; as library volumes, the books are read with *interest*, and cannot fail to do good.

An earnest spirit of inquiry is awakened in our membership—we hope it may *increase*.

Your circular of September 1st, did not reach us directly, as it went into the hands of our former secretary. We hope this year to do something in answer to the circular.

Our farmers are many of them, since the wheat crop has seemed to fail, giving attention to fruit growing. Our soil is doubtless very fine for such purposes, and the argument, in shape of ready cash returns, is all prevailing.

PALMYRA UNION AGRICULTURAL SOCIETY—*Report of the Acting Corresponding Secretary.*—The year 1859, was one of uncommon prosperity to our Society. The last annual meeting was fully attended, and characterized by great unanimity of sentiment, and cordial concurrence in the plans and measures adopted. Much of the success of the past year may be traced to the good feeling which pervaded that meeting. Through the beneficence of a bountiful Providence, the labors of the husbandman were rewarded by an unusually plentiful harvest,—seeing the earth doing so well her part, every farmer seemed stimulated to put forth more than ordinary exertion,—and the same inspiring influence being thus communicated to every department of society, a revival of confidence, and a greater commercial activity necessarily followed, affording thus another evidence of the truthfulness of the maxim, that agriculture lies at the foundation of national prosperity. The members of this Society, and others residing in the vicinity, partaking largely of this feeling, exhibited their characteristic enterprise, by uniting to make the annual fair a close approximation to what an agricultural fair should be.

The days selected for the annual exhibition were auspicious, and the attendance gratifying. The address, by D. D. T. Moore, Esq., editor of the Rural New Yorker, was a masterly production, deeply interesting and highly practical. The absorbed attention with which it was listened to by more than two thousand persons, showed that it reached the masses, and was appreciated by them.

Notwithstanding the society has reason to congratulate itself upon the success of the past year, it should by no means be taken for granted that we cannot do much better next. Additional sources of attraction may be found and the sphere of the society's usefulness greatly extended. If a

certain portion of time during the annual exhibition was set apart for the sale and exchange of stock, and the members should make an effort to induce those having stock to sell, and those wishing to purchase, to meet on our grounds, there is little doubt the proposition would meet with favor, and prove highly serviceable to the community. More encouragement should be given to the mechanic and artisan, since it is from the workshops of these that agriculture procures those finely wrought and well adapted implements, without which its progress would be comparatively slow. It would be unsafe to say that the improved systems of culture of the present day, and the superior croppings from the fields of the farmer, is due less to the improved tools with which his work is done, than to the science which has been applied to agricultural industry. In fact both of these branches of labor are mutually dependent and should be fostered by agricultural societies without undue discrimination in favor of either. The advantage of a flourishing agricultural society, in promoting the success of every industrial pursuit, can scarcely be overestimated. Like other public institutions, it serves to make a residence in the neighborhood more desirable, and to enhance the value of property. Whatever time or money is judiciously expended for such purpose will not fail to repay those by whom it is done, besides conferring upon the community great advantage. No section of country possesses superior facilities for making the annual exhibition of an agricultural society interesting and profitable than our own immediate vicinity. Its climate, position and variety of soil, adapt it to the production of all the leading cereals, and the very best fruits; while as a region for grazing, it is fully equal to most other portions of the State, and certainly there is no want of intelligence and enterprise to render every natural advantage available. It only remains to enlist the sympathies and arouse the energies of the people generally, so as to engage them in the work, as a portion are already engaged, and it will be but a short time ere the rewards of labor will be largely increased.

Agricultural societies are rapidly dispelling the pernicious delusion that labor, whether in the field or workshop, is a badge of dishonor or lack of spirit. They are teaching the world that no profession or employment should rank higher than that of cultivating the soil; in fact, farming has become a profession second in rank to no other. Each year witnesses new triumphs. The learned, the scientific of our own and other lands, are laying down their proudest triumphs over the secrets of nature, at the feet of agriculture. Through the medium of agricultural publications, every discovery is placed within the reach of all, and even the mistakes and failures of one, become the stepping stones of success to another. A more extended circulation of these papers would be highly advantageous to society. What farmer ever took a good agricultural paper for one year, who afterwards regretted it? Or who did not for some of its teachings or suggestions, reap ten-fold over its cost?

SKANEATELES FARMERS' CLUB. Thirty meetings have been held, many of which were on business pertaining to the fair. Three for the ex-

hibition of flowers, fruits and vegetables. The remainder have been occupied in discussions, lectures, &c.

I would suggest the experiment of an exhibition during the present winter somewhat on the plan of a mechanics' fair. I think it would have a beneficial effect in enlisting and forming a bond of union between the agriculturist and mechanic that is desirable.

As the institutors of the first *agricultural fair* in this State, the Skaneateles Agricultural Association, now merged into the Farmers' Club, has claims that no other society in the State can have. None I say, for there is sufficient proof that the Skaneateles fair is the oldest established agricultural one in the State, and as such is a beacon to all.

Remember, too, that this institution has been conducted on free and liberal principles. No fostering legislative aid has been tendered this society though freely bestowed on others.

As we have existed near twenty-five years without such aid, we trust we can do so in future, though such aid would be appreciated, and would be more justly applied than is generally the case.

TONAWANDA VALLEY AGRICULTURAL SOCIETY.—The Society is unlimited in its boundaries, offering premiums to all competitors, and admitting members from all localities near or distant. Seventeen contiguous towns have joined in its annual fairs in a single year, by a respectable representation of members and articles on exhibition.

Buffalo, Rochester and Suspension Bridge, and various other places, have in the last year contributed some very fine specimens to make up the fairs.

The past year, although unfavorable to many of the agricultural productions of the earth, has been a favorable one for the Association.

Besides the annual fairs, this Society holds quarterly meetings through the year, and monthly meetings during the winter. At these meetings, addresses have been made, seeds distributed, and various agricultural questions discussed, which have been of practical benefit to those who have attended, and have been the means of diffusing a more general inquiry for more practical knowledge in the various and complicated arts of husbandry.

The Society owns no grounds—has no permanent locality except that indicated by its name—but it has a spacious tent, and a valuable library of about 100 volumes, and a few specimens, as the beginning of a mineralogical cabinet.

ULYSSES, COVERT, AND HECTOR UNION AGRICULTURAL AND HORTICULTURAL SOCIETY.—Our Society, comprising the towns of Ulysses, in the county of Tompkins; Covert, in the county of Seneca; and Hector, in the county of Schuyler, was organized January 15th, 1859.

The Society held its first fair at Trumansburgh, Tompkins county, on the 28th, 29th, and 30th of September last. The board of managers had previously leased about ten acres of land, for the term of five years, with the privilege of purchasing the same at any time it deemed best. They

enclosed it with a substantial fence, and constructed a circular track, one third of a mile in length, 60 feet wide, and properly graded. They also erected on their grounds a suitable building, 40+84 feet, two stories high, for the accommodation of exhibitors. A large amount of labor on the track, and also on the "Hall," was gratuitously done by members of the Society.

It is evident that the large responsibility assumed by our board, in the construction of the fixtures on the fair grounds, contributed very materially to the success of the fair, but more than all else, our farmers regarded it as *their* fair, and entered into it with all the *union*, and *harmony* and *spirit*, necessary to ensure success. All were well pleased and happy, and at the termination of these truly *gala days*, resolved to do yet better next fall.

Officers Town and Union Agricultural Societies.

Name of Society.	Counties.	President.	Secretaries.	Treasurer.
Afton.....	Chenango.....	P. Northrup....	Wm. Beaman..	George Saunders.
Albion, New....	Cattaraugus....	R. J. Waters ...	L. A. Kinnicott.	Albert Eddy.
Bainbridge.....	Chenango.....	J. Bush.....	J. Julland, 2d..	J. Julland, 2d.
Bedford.....	Westchester....	J. J. Wood.....	I. S. Holmes....	A. F. Dickinson.
Brookfield.....	Madison.....	E. Beebe.....	J. G. T. Bailey..	Calvin Whitford.
Camden.....	Oneida.....	T. D. Penfield..	George Elder....	Thomas Stone.
Canaan.....	Columbia.....	S. Barstow.....	E. W. Bostwick..	E. Kellogg.
Caneseraga.....	Allegany.....	W. M. White....	G. A. Sanders....	J. L. Embress.
Cazenovia.....	Madison.....	Elliot Card....	E. D. Loomis....	C. L. Chappel.
Chautauqua East'n	Chautauqua....	N. M. Carpenter	A. S. Brown.....	A. Bagg.
Chautauqua.....	do.....	A. S. Moss.....	J. C. Mullett....	E. Baker.
Conewango, Union	Cattaraugus....	H. Aldrich.....	H. A. McConnell.	D. A. Gardner.
Conewango Valley	do.....	D. Bowen.....	S. Scudder.....	H. F. Wilder.
Constantia.....	Oswego.....	F. W. Miles....	E. R. Farrington	James Dickie.
Coventry.....	Chenango.....	C. P. Blakeslee.	M. S. Parker....	D. Beecher.
Danby.....	Tompkins.....	S. D. Beers....	E. L. B. Curtis..	S. Foster.
Dryden.....	do.....	A. Snyder.....	L. Griswold....	T. P. McElhenry.
Ellisburgh, Adams and Henderson..	Jefferson.....	C. Littlefield..	J. L. Hunting....	James E. Green.
Fenner.....	Madison.....	L. V. C. Hess..	G. E. Loomis....	C. W. Barrett.
Farmers' Club, Lit- tle Falls.....	Herkimer.....	Zenas Green....	X. A. Willard..	P. Reed.
Farmers' Club, Lewisboro.....	Westchester...	E. Sillick.....	E. Lawrence....	E. Lawrencot.
Farmers' and Me- chanics' Club, Nelson.....	Madison.....	D. Norton.....	T. Medbury....	H. Burgess.
Farmers' and Me- chanics' Union, Pomfret.....	Chautauqua....			
Galen.....	Wayne.....	Wm. Gillett....	J. Walton.....	T. Plumtree.
Gorham.....	Ontario.....	W. T. Swart....	S. McPherson...	A. Root.
Gouverneur.....	St. Lawrence...	H. H. Haile....	G. Parke.....	G. Parke.
Gowanda.....	Erie and Cattau's	D. M. Browne..	H. F. Allen.....	H. F. Allen.
Hamilton.....	Madison.....	C. R. Ackley...	N. Brownell, Jr.	D. B. West.
Hartland.....	Niagara.....	A. Kitteridge..	J. C. Dewell....	P. Culver.
Harpersfield.....	Delaware.....	R. E. Davis....	M. S. Wilcox...	M. S. Wilcox.
Harpersville.....	Broome.....			
Ithaca.....	Tompkins.....	John Giles....	N. Crittenden..	D. C. Hazen.
Jefferson.....	Schoharie.....	D. W. Gallup...	E. Shelmandine.	E. Danforth.
Lebanon.....	Madison.....	F. H. Ingalls..	E. B. Niles.....	B. C. Bristol.
Lenox.....	do.....	B. F. Avery....	I. N. Messenger.	T. F. Hand.
Leon.....	Cattaraugus....	C. Morgan.....		
Lodi.....	Seneca.....	S. B. Smith....	J. Van Horn....	A. Woodworth.
Middlebury.....	Wyoming.....	A. W. Blackman	M. Weed.....	M. Weed.
Naples.....	Ontario.....			
Ossining.....	Westchester....	D. D. Sherwood.	H. C. Vail.....	C. A. Fowler.

Officers, Town and Union Agricultural Societies.—(Continued.)

Name of Society.	Counties.	President.	Secretaries.	Treasurer.
Perry and Castile.	Wyoming	A. Palmer	S. M. Howard	R. Mordoff.
Rushville	Yates	A. S. Thomas	J. Sayre	C. D. Castle.
Sandy Creek	Oswego	O. R. Earl	E. H. Sargeant	P. M. Newton.
Sangerfield & Marshall	{ Oneida	S. Clark	G. H. Church	D. B. Goodwin.
Skaneateles	Onondaga	A. Frost	W. M. Beauchamp	W. J. Townsend.
Smyrna	Chenango			
Susquehanna Valley	{ Otsego	J. E. Sherman	R. W. Courtney	C. J. Hayes.
Summit	Schoharie	E. Brown	D. L. Rider	D. G. Spencer.
Tonawanda Valley	Wyoming	J. G. Shepard	A. S. Stevens	F. R. Wright.
Union, Brockport	Monroe	E. B. Holmes	H. N. Beach	T. Cornes.
Union, Palmyra	Wayne	L. Sanford	C. H. Rogers	G. W. Cuyler.
Union, Winfield	Herkimer			
Union, Ridgeway	Orleans	H. Bowen, Jr.	E. F. Brown	G. F. Anthony.
Union, Covert,	{ Seneca and	T. Boardman	L. H. Owen	F. S. Dumont.
Hector, &c.	{ Tompkins			
Union, Marathon	Cortland	John Corp.	L. Adams	J. Hurlburt.
Van Buren and Lyander	{ Onondaga	A. H. Toll	N. M. White	B. Chase.
Vernon	Oneida	E. Wilson	L. T. Marshall	E. Chase.
Vienna	do	P. Mattoon	P. W. Leet	Lyman Stedman.
Victory	Cayuga	P. Camp	D. L. Halsey	J. F. Gregory.
Virgil	Cortland	J. G. Tyler	W. A. Wood	E. Winslow.
Wilson	Ningara	A. Petit	E. S. Holmes	B. Dearborn.
Wiskoy	Wyoming	M. A. Hall	C. Stebbins	J. Renwick.
Yates	Orleans	G. Clark	C. H. Lum	N. P. Johnson.

Agricultural Statistics.—To show the importance of agricultural statistics to the farmers of New York, we give from the Ohio Cultivator a list of sheep killed and injured by dogs in the year 1858, as returned by the assessors, amounting to \$146,748.

Is there a farmer in this State, who, if satisfied, as he would be if we had an annual return like this of Ohio, would submit to this destruction of his property, by the worthless curs that are roaming over his fields. We hope that an effort will be made to secure the passage an act, requiring an annual return, by the assessors, of the agricultural resources of the State.

Sheep killed and injured by dogs in 1858, and Table of hogs in 1859.

COUNTIES.	KILLED.		INJURED.		No. hogs returned in 1859.
	Number.	Value.	Number.	Value.	
Adams	679	\$943	176	\$154	34,867
Allen	433	683	228	117	24,429
Ashland	644	1,345	545	770	29,897
Ahtabula	365	834	160	206	5,960
Athens	891	1,496	189	153	17,854
Anglaize	456	573	80	79	19,446
Belmont	1,099	2,131	1,125	1,458	33,242
Brown	893	1,436	249	249	35,181
Butler	436	905	179	238	42,012
Carroll	425	898	376	426	15,804
Champaign	682	1,460	564	729	32,878
Clark	765	1,437	245	422	30,760
Clermont	819	1,345	228	228	34,740
Clinton	817	1,845	400	837	41,952
Columbiana	734	1,582	570	780	20,580
Coshocton	749	1,459	841	587	38,051
Crawford	724	1,230	2,366	1,254	34,857
Cuyahoga	983	2,353	1,113	840	8,203
Darke	644	1,287	277	247	34,130
Defiance	312	543	69	170	13,715
Delaware	781	1,473	553	683	35,052

Sheep killed and injured by dogs in 1858, &c.—(Continued.)

COUNTIES.	KILLED.		INJURED.		No. hogs returned in 1859.
	Number.	Value.	Number.	Value.	
Erie	401	\$711	165	\$172	8,860
Fairfield	1,289	2,539	718	786	44,856
Fayette	1,466	2,257	938	776	43,109
Franklin	1,195	2,391	422	738	55,619
Fulton	316	670	105	83	11,413
Gallia	881	1,200	136	92	18,990
Genuga	186	420	59	78	3,969
Greene	1,267	2,332	820	673	41,486
Guernsey	585	1,272	324	494	23,616
Hamilton	380	640	5	4	38,573
Hancock	509	797	162	200	28,995
Hardin	410	641	168	147	18,636
Harrison	587	1,404	1,473	1,683	17,408
Henry	90	154	13	15	8,210
Highland	1,410	2,284	495	547	54,386
Hooking	944	1,148	111	99	17,623
Holmes	670	1,273	468	387	28,870
Huron	710	1,428	371	467	22,891
Jackson	1,200	1,439	142	135	18,003
Jefferson	799	1,750	353	543	15,483
Knox	901	1,746	432	569	38,146
Lake	408	734	97	144	3,207
Lawrence	617	824	78	91	15,961
Licking	1,265	2,992	1,057	1,311	45,804
Logan	1,046	1,968	703	644	27,463
Lorain	433	921	136	298	10,319
Lucas	247	443	124	140	7,024
Madison	545	955	479	682	24,760
Mahoning	572	1,625	617	998	12,472
Marion	999	1,632	791	609	28,957
Medina	598	1,336	837	973	13,399
Meigs	605	1,000	98	103	14,051
Mercer	305	414	71	76	18,267
Miami	1,124	1,774	466	547	28,864
Monroe	620	917	97	124	18,709
Montgomery	288	594	53	49	34,875
Morgan	604	1,015	346	361	.....
Morrow	665	1,110	295	363	29,268
Muskingum	1,206	2,484	786	732	42,840
Noble	565	961	240	274	22,974
Ottawa	160	253	87	10	6,880
Paulding	99	153	8	11	5,995
Perry	657	1,313	820	487	29,045
Pickaway	773	1,649	1,520	595	50,408
Pike	506	670	94	71	21,569
Portage	449	976	455	355	9,494
Preble	580	979	96	118	44,135
Putnam	440	608	119	122	18,754
Richland	971	1,603	456	490	36,447
Ross	1,365	2,042	203	215	64,713
Sandusky	901	1,510	368	364	20,733
Scioto	880	1,043	125	49	20,805
Seneca	973	1,651	781	786	30,624
Shelby	771	1,244	220	235	21,790
Stark	618	1,269	719	711	76,419
Summit	829	1,789	907	722	14,191
Trumbull	550	1,566	357	369	8,719
Tuscaroras	779	1,189	526	653	35,685
Union	376	691	203	178	23,012
Van Wert	200	229	83	59	13,243
Vinton	508	669	51	37	13,859
Warren	648	1,348	187	199	32,718
Washington	976	1,686	515	528	21,663
Wayne	747	1,403	657	779	39,246
Williams	188	305	100	147	15,075
Wood	397	713	68	205	14,223
Wyandot	951	1,766	962	751	23,164
	60,536	\$109,661	36,441	\$37,097	2,174,298

DR. FITCH'S SIXTH REPORT ON THE NOXIOUS AND OTHER INSECTS OF THE STATE OF NEW YORK.

The sixth report of Dr. Fitch, which was being prepared for this volume of the Transactions, has been delayed by his illness, which has prevented its completion in time for this volume. It will be given in the succeeding volume, together with the seventh report. The delay will enable him to prepare the report more fully than he would have been able to do, had his sickness not prevented its completion. His health is now restored, and he will prosecute his work with renewed energy in preparing the most important reports of the investigations thus far.

We are gratified at the great interest manifested in these investigations. The demands for the reports already published, come from every section of our own country, and from every foreign country with which we are in correspondence. The saving to many of our farmers and horticulturists, by observing the directions given in the reports published, have already amounted, we are confidently assured, to more, in a pecuniary point of view, than the entire expenditure made for the promotion of agriculture by our State government. We are confident that each succeeding year will add largely to this amount, as the number of intelligent farmers will be increased, who will adopt the suggestions made in relation to the culture and preservation of their trees, and the advice given in relation to the ravages of the devastating insects upon their crops and fruit and forest trees. We trust the Doctor's health and strength will be preserved so that he shall be enabled to complete his work, and leave to the farmers of our country a legacy more rich than that which any hero has ever given the world.

We are gratified in presenting two addresses of Dr. Fitch before the Society; one giving a summary view of "our most pernicious insects," the other "on the curculio and the black knot on plum trees."

These will be found of great value, and the latter, on the curculio, is one of the fullest and most reliable publications on this destructive insect and its ravages which has been published. The remedies which have proved the most efficacious are here given, and we cannot doubt, that a careful examination of these, and strict attention to the suggestions given will prove of incalculable advantage to our fruit growers.

J.

ADDRESS, ON OUR MOST PERNICIOUS INSECTS,

DELIVERED AT THE ANNUAL MEETING, FEBRUARY, 1859.

By ASA FITCH, M. D., *Entomologist of the Society.*

[NOTE.—The Society has done me the compliment, each year, of requesting for insertion in its Transactions, a copy of the Lectures I have delivered at its annual meetings since I was honored with the appointment of its entomologist. But as everything of value in those Lectures has usually been embodied in a more full and definite form in my annual reports, I could not regard it as either necessary or judicious to thus encumber the Society's volumes with repetitions of the same observations. As the following Lecture, however, in addition to some general views of the subject, contains a succinct statement of the habits of several of our most pernicious insects, with reference to specimens which are permanently remaining open to public view in the Society's Museum, it perhaps possesses sufficient value to entitle it to the publicity here given it.]

Mr. President and Gentlemen—It was long ago remarked, and the saying has often been repeated, that "*America is the land of insects.*" It is not difficult to perceive what has given rise and currency to this sentiment. When this branch of science was in its infancy, Linnæus, the great legislator of Natural History, gave to one of the large, beautiful moths, common in the United States, a name, indicating it to be the head, the king, of the whole insect race. Eighty and a hundred years ago, the specimens of insects which were gathered in this country and taken to Europe, showed to the men of science there, so many singularly formed objects of this class, widely differing from anything which had been discovered in the old world, that it naturally impressed them with the idea that this quarter of the globe was peculiarly rich in curiosities of this kind. And about the same period, the sweeping havoc in our wheat crops, which was made by the Hessian fly, was a phenomenon unparalleled in the whole history of wheat culture from the early ages of the world down to that time. That a minute insect, nestling in the root and stalk of the growing wheat, should be so excessively numerous as to find every blade in the field, and totally destroy this crop over a wide extent of country, excited the astonishment and also the alarm of the whole civilized world. And from an occurrence so novel and so remarkable, it might well be inferred that there must be something in the climate, or some other physical peculiarity of this country, eminently favorable to insect life, to cause these creatures to become thus excessively multiplied.

And that *America is the land of insects*—that we are here sustaining greater losses from this class of objects than are experienced in corresponding parts of the old world—and that we shall be obliged to study their habits in order to successfully combat them and prevent their ravages, before our soil can possibly sustain so dense a population as exists *there*, scarcely admits of a doubt.

In the researches in which I am occupied, I have constant occasion to examine the statements which European writers give of *their* injurious insects, and the depredations which they commit, in order to compare them with our insects here. I thus come to know it as a fact, that the losses

which we sustain from these pests, *immeasurably* surpass everything of this kind to which they are subject in Europe. Insects which attract much public attention there, and are regarded as *serious evils*, would, in this country, be deemed scarcely worthy of notice, the damage they occasion is so trivial. There, if an insect appears in their wheat fields, by which the crop is shortened an eighth or a tenth from its average yield, whole communities become alarmed; whilst here, so slight a loss would be disregarded and would pass wholly unnoticed. The self same insects, which there appear *tame*, and only occasionally show themselves as depredators, now in one district and then in another—these same insects, on passing across the Atlantic, appear to become armed with the club of Hercules. On reaching our shores, they multiply;—they advance over our country like an invading army;—they utterly devastate the vegetation which they attack;—they continue their destructive work season after season;—and it is *not* till after a long series of years that they become perfectly naturalized in our midst, and sink back into their appropriate sphere, so as afterwards to remain within the bounds which Nature appears to have designed they should occupy. Such at least has been the history of the Hessian fly, before mentioned—the insect with which we have had the most extended and full experience. Originally introduced into the town of Flatbush on the west end of Long Island, doubtless in some of the straw which they had used for packing their goods, by the Hessian troops which disembarked there the latter part of August, 1776, it two and three years afterwards became so multiplied as to destroy the fields of wheat in that town. And from thence as a central point it gradually spread, extending itself in every direction, till it penetrated the farthest bounds of our territory where wheat was grown—marching over our country like a triumphant conqueror—for several years devastating the wheat crop wherever it arrived, and afterwards repeatedly returning and renewing its ravages after it was hoped it had disappeared. But now, for many years, we have heard little of the Hessian fly, and it would scarcely be known that we had such an insect in our country. A person engaged in collecting insects, however, will every year meet with a few of these flies, in sweeping with his net in almost any of our wheat fields. Why does it never multiply now, and cut off our crops as it did formerly? I doubt not it is because its insect enemies have now become so well acquainted with it and so skillful in combatting it, that if it begins to grow numerous in any district, they immediately multiply also, and thus overpower and suppress it.

And what has been the European history of this same insect? During the half century that it was committing such havoc upon this side of the Atlantic, no traces of any such insect were found in any part of Europe. And notwithstanding the manner in which it first appeared here, and gradually advanced over our country, plainly indicated that it had been introduced, yet the world with one consent adopted the opinion that it was a native insect of this country, and that it did not exist elsewhere. It was not till the year 1833 that we had any evidence that this insect was

to be found in Europe. That year, in two of the German principalities, the wheat crop was seriously injured by an insect so like the Hessian fly that M. Kollar, in his Treatise on Insects, published four years afterwards, pronounced it to be that insect, though others doubted his being correct therein. And the following year, 1834, Prof. Dana, of New Haven, who, in company with Mr. Herrick, had made the Hessian fly a subject of special investigation, on going into the wheat fields along the shores of the Mediterranean, at once detected this same insect there, both in Spain, Italy, and on the Island of Minorca. This discovery he communicated to Mr. Herrick, by whom an article on this subject was communicated to *Silliman's Journal*—this being the first dissent on record to the then universal belief which had so long prevailed, that this insect did not exist in Europe.

And finally, in 1851, along the banks of the Volga in Russia, the wheat crop was severely injured by an insect that we have quite conclusive evidence was the Hessian fly. This Volga insect is described by Col. Motschulsky, as a new species, like the Hessian fly of the United States in its habits and appearance, except that it is paler colored, and not black as Mr. Say represents the Hessian fly to be. Now when it first hatches from its pupa state, our insect is of a tawny yellow color, and I cannot but think that had the Russian entomologist kept his specimens alive, he would have found them within two or three days changed to black.

These few facts, the appearance of this fly in Germany in 1833, along the shores of the Mediterranean in 1834, and on the river Volga in 1851, comprise all of the European history of this insect—an insect so rare in its native haunts that it is scarcely known to exist there, but on being brought to our shores has caused a loss to us of uncounted millions of dollars.

The wheat midge also, it is probable, is doing more damage at present, in a single year, in the State of New York, than the total aggregate of the losses which it has occasioned in Europe. Mr. Curtis, in his papers on the insects affecting the grain crops of Great Britain, gives no intimation that a wheat field has ever been known to be so badly devastated by the midge or by any other insect, that it was not worth harvesting. But in this country we at the present time, have the midge throughout the northern and middle States; at the south they have the joint worm; at the west the chinch bug; three insects in the different sections of our country, each destroying the wheat crop to an extent which appears to be unparalleled by anything known of this class of creatures in our father-land.

Nor is it in our grain crops merely—in our orchards, in our gardens, *everywhere* in fact, we see similar evidences that "America is the land of insects." Look at the bark-louse of the apple tree, which, though common throughout the continent of Europe, has never shown itself as a serious evil there. But in this country, through a large district bordering on Lake Michigan, every apple tree has of late years been overrun and almost every tree has been killed by this very insect.

It is unnecessary to recite further facts, of which there are many bearing upon the same point. Enough has already been advanced to show that our country, although so favored of Heaven in most respects, is more in-

fested, and is sustaining greater losses from enemies of this kind, than any of the other sections of the world the climate and productions of which correspond with ours.

This being our situation, we readily perceive how important, how indispensably necessary it is, that the habits of this class of objects should be thoroughly investigated, and that full and correct information with respect to them should be obtained and should be disseminated among the cultivators of our soil. For, with the meager knowledge which they at present possess upon this subject, they are powerless, and these pests are allowed to commit their depredations unchecked and unopposed.

As so little knowledge of these creatures is diffused through our community, and so very few persons have ever seen the insects which are causing such vast losses in our land—the parents which breed the different kinds of worms and caterpillars which we see devastating our fields of grain and our fruit trees—I have thought I could not render this audience a more acceptable service, and occupy a portion of your time this evening more profitably, than by exhibiting to you specimens of some of our most destructive insects;—since a first and most important step towards a knowledge of any object, is, to have a clear and accurate idea of the looks, the appearance of that object; and it is impossible for the mind to gather from written descriptions or from drawings, so vivid and satisfactory an impression as is instantly obtained by a view of the thing itself.

Unfortunately however for an exhibition of this kind, several of the most important of our injurious insects are so exceedingly minute, that the eye, without the aid of glasses, is unable to discern anything more than their general appearance, their size and color. We are obliged to take them, however, just as nature has formed them. They will not expand themselves and become more distinctly visible, for our accommodation. And in order to see them at all, it is necessary that the specimens be taken in the hand, and so held that the strongest light which we have in the room, will fall directly upon them. Moreover, these minute objects, when dried and preserved, are so very fragile that a breath of air would break them into fragments—so that were they openly exposed, they would be destroyed before a dozen persons perhaps had looked at them. I have therefore endeavored to make the best arrangements for presenting them to your view, that their delicacy will admit of. They are placed in glazed boxes, which can be passed from hand to hand through the audience. And the several specimens in each of the boxes, are ticketed separately, and so plainly, that every one will readily understand what it is that he is looking at. All the specimens being thus distinctly explained by the labels attached to them, I think everything contained in each box will be intelligible and perfectly understood by every person into whose hands they come.

And I would further state, that, as such minute objects can always be seen so much better by daylight, than they can be by even the best artificial light, these same specimens will be on exhibition at the Agricultural Rooms, through the day, to-morrow—after which they will be placed in the Insect department of the Museum of the State Agricultural Society.

Preparatory to passing these specimens into the hands of the audience, I may briefly state the contents of each box. I have selected for exhibition and for a few remarks on this occasion, *nine* of the most pernicious and destructive insects which we have in our country. *Five* of these are depredators upon *the wheat crop*, and to some extent upon our other grain crops in districts where they do not find all the wheat they require for their accommodation. These five insects are,

The wheat midge, the grain weevil, the Hessian fly, the joint-worm, and the chinch-bug.

All these are very small insects. Yet, notwithstanding their diminutive size, and their seeming insignificance, some of them have done and are doing a greater amount of damage by far, than any of our other noxious insects. After looking at these pigmies, I presume it will be a relief to your eyes to be presented with something larger, and more cognizable to the senses; and I have therefore selected *four* of the most important depredators upon our fruit trees, namely,

The moth which produces the caterpillars upon our apple and cherry trees,

The apple tree borer, the peach tree borer, and the curculio or plum weevil.

Many persons in the audience, I doubt not, will inspect these specimens more intelligently, and will recollect their appearance much better, if, as I hand them out, I state the contents of each box, and say a few words explaining the particular habits of each of these insects.

First, then, the Wheat midge.—This is the insect which, of all others, is doing us the most damage at the present time—causing a loss to the farmers of our State, amounting to millions of dollars annually. As already stated, the midge is spread everywhere through the wheat-growing districts of the Northern and Middle States, and also through Canada and Ohio. This insect is an exceedingly small, bright yellow fly, not a quarter the size of the common mosquito. And though there are countless myriads of these flies in every part of our State, very few persons have ever seen this fly, knowing it to be the midge.

It may add to the interest with which you will look upon one of the specimens in this box, to be informed, that I suppose you are there viewing, what only two persons in the world have ever seen, before this evening—the male of the wheat midge. We learn from Mr. Curtis, that this has never yet been found by any of the British entomologists, and only one person in Europe is known to have discovered it—Meigen, a German writer on insects, who has been dead many years. On coming to see what a mere atom this male fly is, you will be little surprised that collectors have so universally failed to detect it—for (if I may be allowed a Hibernicism) on looking at it, you will find it's so small you can't see it. The specimen is so placed as to project from the point of a triangular piece of paper, to which it is glued; and all that the sharpest eyes will be able to perceive, is an appearance like small fibres of gossamer adhering to the point of the paper. But if the light in any part of the room throws a shadow, this shadow, falling on the white paper under the specimen, will be much more visible, and more like an insect than the object itself is. And the magni-

fying glass shows this specimen to be quite perfect, the wings, the long antennæ, like strings of beads, the feet, every part in fact, being hereby rendered beautifully distinct.

By the side of this invisible object, you will see the female fly of the wheat midge, glued upon a square slip of paper with its wings extended—whereby it is rendered much more distinct.

This fly, it will be remembered, deposits its eggs in the heads of the young wheat, from which hatch minute worms or maggots of a bright yellow color, which lie inside of the chaff, and in contact with the young soft kernels of the wheat, from which they abstract the nourishment, so that these grains or kernels become shrivelled and dwarfish. In addition to the male and female flies of the wheat midge, I have placed in the box several of the small yellow worms, taken from wheat heads, and glued to a slip of paper, and also, glued to another slip of paper, several kernels of wheat, shrivelled by this insect.

This is the same insect which, in many neighborhoods, is called the weevil—the most inappropriate name that could possibly be given to it, for the midge is no more like a *weevil*, than an eagle or a hawk is like an elephant. And to show how very dissimilar the two insects are, I have placed in the same box

The *grain weevil*, an insect which infests the dry, stored wheat, in the bins in granaries and warehouses, but never attacks it when it is growing in the field. The grain weevil originated in Europe and is quite common there, but is only occasionally met with in this country; an American insect very closely like it, named the rice weevil, being much oftener found with us, in wheat, in Indian corn, and other grains which have been long kept, as well as in rice.

In this *second box* you will see a specimen of the *Hessian fly*, of which I have already spoken somewhat fully; and also a specimen of the white worms or larvæ which hatch from the eggs of this fly, and several of the brown pupæ or *flax seeds*, as they are commonly called, into which the worms change after they get their growth. These worms and flax seeds are found at the roots of the young wheat plants in autumn and winter, and after the stalks shoot up, the following spring, a second brood of them appears, lying immediately above the lower joints, in the straw, weakening the stalks so that they break and lop down.

You will also see in this box, a specimen of the straw, thus broken, and showing several of the flax seeds imbedded in it.

In another box you will see specimens of the fly which produces the *joint-worm*, which of late years has wholly destroyed the wheat fields in some parts of Virginia—and instances have occurred both in our own State and in Massachusetts, of a closely similar insect infesting fields of barley, and greatly injuring them. But I have no knowledge of its ever attacking the wheat crop with us.

This joint-worm is so similar in its appearance, and in its operations to

the Hessian fly, that we should expect it to be an insect of the same group, a two-winged instead of a four-winged fly. Small white worms are found, lodged in little cavities in the straw, mostly at the joints, causing the straw to become swelled, uneven and knotty. In the same box you will also see a specimen of the straw, shaved off so as to show the little cavities in which these joint-worms lie, and also another piece of straw with one of these flies coming out of it—his black head protruding from the side of the straw, but so minute you will have to look sharp to see it. And on the upper side of this same straw are two small holes perforated, like pin-holes, from which flies have also come out and escaped.

In this same box you will also see three specimens of the *chinch-bug*, an insect which has of late years severely injured the growing wheat in Illinois and the adjoining States, totally destroying it in some fields. This insect is also common through the southern states. It punctures and sucks the juices from the young wheat stalks; and in dry seasons it becomes so multiplied that the stalks are crowded and black with them, entirely exhausting the stalks of their juices, and causing them to wither and die. And after the wheat is harvested they emigrate to the corn fields, bleeding the cornstalks in the same manner.

The parent insects of two of the most pernicious borers of our fruit trees, are placed in this fourth box—that of the apple and that of the peach tree.

That of the apple tree you will see is a cylindrical beetle of a tawny brown or butternut color, with two white stripes the whole length of its body. This beetle drops its eggs in the crevices of the rough bark, near the root, from which small worms hatch which bore through the bark, and reside between it and the wood the first year, and the second year they bore into the solid wood, greatly injuring and often killing young trees.

One or two facts may here be related serving to indicate the losses we are sustaining from this insect. In the year 1851, an agent of one of the nurseries in the central part of our State, canvassed the county of Washington, and disposed of trees to the amount of \$10,000; nearly all of them apple trees. The estimate will be a moderate one, to say that half of the trees which were thus introduced have now been destroyed by this borer; many persons have lost every tree or almost every one that they planted. We thus have a loss of \$5,000 from this insect in this one county—without taking notice either of the expense of planting and nursing the trees; or of the many trees in addition to these, which particular persons obtained from other sources.

A person visiting me a few months since, remarked, he would himself be willing to pay me a hundred dollars, if, by my researches, I would discover some effectual method of protecting apple trees from the borer; as this insect had occasioned him losses far exceeding the sum he named. Without claiming the reward he offered, I informed him I had already experimented and would give him the very remedy he wished; if he would rub the bark of his trees with soap, the latter part of May each year, I

would guarantee that not one of these borers would ever touch them. Some of the present audience will probably recollect how forcibly one of the most valued members of our State Society, the Hon. A. B. DICKINSON, recommended this same remedy, at one of our annual meetings a few years since. Having had a favorable opportunity, I have since then tested this remedy to some extent, applying it to a part of my trees, and omitting it from others; and the following spring I have found young borers in almost every tree where the soap had not been applied—one tree only $3\frac{1}{2}$ inches in diameter having fifteen in it—whilst not one could be detected in any of the soaped trees.

In the same box is also a male and a female fly of the peach tree borer—the two sexes being very unlike each other, as you will perceive. Like the apple tree borer, this fly places its eggs on the bark low down, at or near the surface of the ground, and the worms from them work downward in the bark of the root, causing the gum to exude profusely. In numerous instances peach trees are supposed to be winter-killed, when it is this borer in the roots that has destroyed them. This same insect works in the root of the plum tree also, when it cannot find all the peach trees it requires for its accommodation. When the worm gets its growth, it crawls up to the surface of the ground, and there surrounds itself with a kind of pod, formed of its chips and castings mingled with gum. A specimen of one of these pods you will see in the box. This pod is placed on the side of the root in a groove of the bark, with its upper end projecting slightly above the surface of the ground; and when the pupa lying in this pod is ready to give out the winged fly, it crowds itself upward out of the pod, its outer shell cracks open, and the fly crawls out of it.

The apple and the peach borers in their larva state, i. e. the large white grubs which are found under the bark of the apple and in the root of the peach tree, are so much alike in their size and appearance, that many persons believe them to be one and the same insect. But you will here see that they are the progeny of insects which have no resemblance whatever to each other.

Finally, in this box is the moth or miller of the apple tree caterpillar—the insect which comes abroad in July, and places the rings of eggs near the ends of the twigs of the apple and cherry trees, from which, the following spring, the caterpillars hatch, which form the large cobweb-like nests in the forks of the limbs of these trees. I exhibit these, chiefly, because these caterpillars are so common, and yet so very few persons have ever seen the moth by which they are produced. Also in this box you will see the cocoon which the caterpillars spin after they disperse themselves and wander away from the tree, out of which cocoon the moth afterwards comes.

In this box I have also placed two specimens of the *curculio*—a beetle, however, with the looks of which all the owners of plum trees are already familiar; as they also are with the little crescent-shaped slit which it cuts in the side of the young plum, dropping an egg into the wound, the worm from which feeds internally upon the fruit, rendering it worthless. And

so common has this insect become, that it is scarcely possible for us now to grow a crop of plums in any part of our State.

Why is it—the devout mind is inclined to ask—why is it, that Providence has inflicted upon us such numbers of these insect pests? But, when we come to take an enlarged, a philosophical view of this subject, we see that it is only incidentally that these creatures become detrimental to man, in subserving a most important work in the economy of nature. Their true office is succinctly stated by Linnæus, who styles *insects—the diligent and faithful servants of nature—perpetually engaged in destroying all that is dead, and checking the increase of all that is living in the vegetable world*. When we look at the work which they perform, we at once perceive its importance. Let us suppose a single one of our forest trees to grow and propagate itself without any check from its insect depredators. Schrank, an eminent German naturalist, in his work on the Fruitfulness of Plants, states that an elm, when twelve years old, produces 164,500 seeds in a single year. Now if none of these seeds were destroyed and none of the young trees which sprout from them, in the course of 12 years we shall have this number of trees, (164,500) of the same size with the parent, and almost two millions of smaller ones from the seeds of the intervening years. And each tree of this vast number becoming equally prolific, we see how speedily the whole earth would be monopolized by them. Incredible as it would at first thought appear, it requires but a few moment's calculation to show, that a person who in his youth saw but one single tree of this kind in our world, before old age came upon him, would see the progeny of this tree so vastly, so infinitely multiplied, that every rod of earth upon our globe would be occupied by them. And we thus see that we have need of every one of the insects which prey upon the elm, to repress its vigorous growth, to destroy its seeds, and to cut down the young trees which sprout from those seeds. None of them can be spared. If only a single one of the many kinds of insects which prey upon it were struck out of existence, we might well fear this tree would thrive and usurp such a place as would disturb the balance and mar the harmony which now exists in the domain of nature. We thus see that should a single minute insect of the vast multitude which we have, become extinct and disappear from our world—this one link being broken might produce a commotion in the whole length of the chain, and convulse the laws which regulate the natural world.

We at this time have in some parts of our country, an example of the manner in which a plant will thrive and extend itself when released from its insect enemies—a worthless weed which is rapidly overspreading whole fields, crowding out every blade of grass and every other plant. I refer to the *Antirrhinum* or *Linaria vulgaris* of botanists, known by the different names of snap-dragon, butter-and-eggs, toad's flax, &c. We have received this weed from Europe, and several insects I see are specified by European

*The *Calophasia Linaria*, which wholly consumes the leaves from the stalks, the *Cliocampa geographica*, *Cleopha Antirrhini*, *Eupithecia Linariata* and *pulchellata*, *Coronia ferrugata*, etc.

authors as subsisting upon it.* But in this country I cannot find a single insect or worm feeding upon this plant. Seldom even can a grasshopper, an insect which devours all kind of vegetation indiscriminately, be started up in the midst of a patch of these weeds, although they may be plentiful upon the surrounding herbage. And I am firmly persuaded that this weed thrives and usurps the place which it does, because it here grows without let or hindrance from any insect destroyers; and that this evil will continue, until by accident, or by the hand of man, some of the insects which prey upon this plant in Europe, are introduced upon this side of the Atlantic.

And we can now see why it is that insects become such pests to the agriculturalist and the fruit grower. It is their office to preserve a due balance in the vegetable world, and to check every tree and plant from extending itself and usurping a place which does not belong to it. Now it is the very aim of man to *destroy* this balance. It is the object of all his labors and toils. He sweeps away the forest trees which nature planted upon his lands; he exterminates the wild grasses and weeds which nature causes to spring up; he sows his grounds to wheat; it is his object to make this one plant occupy the land, to the complete exclusion of the hundred other plants which nature designed should diversify the same spot. Nature, as it were, resents this violence done to her arrangements, and seeks to restore the equilibrium and preserve the harmony which her laws require. And thus it happens that those insects which live upon wheat, whose office it is to check this plant from becoming too extended and occupying a greater portion of the earth's surface than belongs to it in the economy of nature—*these insects* attack and destroy this crop. It is nature's appointed way for preserving the balance in her domain, and preventing one of her subjects from overpowering others and crowding them out of existence. In one word, it is an instance of that

“partial evil, universal good,”

of which the poet sings.

And hence we see that the farmer's vocation requires something more than the plowing of his fields and sowing his seed. As he interferes with the arrangements of nature in doing this, nature will revenge herself, by sending her insects into his fields to destroy what he has sowed. He must learn to combat these or he will be subjected to most serious and vexatious losses. To render his pursuit successful, therefore, it is indispensable that he be acquainted with the different insects which prey upon the crops which he cultivates. He requires, as a first step, to know their looks, in order that he may recognize any one of them, that makes its appearance in his fields. And he requires to be acquainted with their history and habits, that he may be able to adopt suitable measures for frustrating their operations, and preventing the losses which, if unchecked, they are liable to occasion.

Many persons, on contemplating the myriads of these creatures with which our country and world is inhabited, in connection with their usual extreme minuteness, the obscure situations in which a large portion of them

lurk and the various ways by which they appear to place themselves nearly or quite out of our reach—many, I say, are inclined to despair of its being possible for man to resist them with any prospect of success. But I cannot think that Divine Providence has placed in our world any enemy of this kind, without also endowing man with sufficient intelligence to discover a remedy by which it will be practicable for us to frustrate or overpower that enemy. The more I examine these creatures the more confirmed I become in the opinion that there is no injurious insect in our world, but that, when we come to study its habits and transformations and become perfectly acquainted with all the details of its history, we shall be able to detect some assailable point and devise some measure by which either the insect can be destroyed or the vegetation on which it depredates can be shielded from its attacks. We shall discover that, although he may be invulnerable in every other part, no ægis protects his heel, and if we strike Achilles there, we inflict a death-wound.

ADDRESS

OF ASA FITCH M. D., ENTOMOLOGIST OF THE SOCIETY,
ON THE CURCULIO AND BLACK KNOT ON PLUM TREES.

MR. PRESIDENT AND GENTLEMEN :

The Curculio or Plum weevil and the Black knot excrescences on plum and cherry trees having been prominent in my investigations since I last addressed you, I have thought these would be as interesting as any subjects I can select, on which to speak at this time. I am the more induced to make the Curculio a prominent topic of the present lecture, since no particular account of this important insect has yet been given in my Reports on Noxious Insects, and may not appear for a while to come, for the reason that I aim to introduce nothing in those Reports which has not been authentically ascertained by actual observation, and an important portion of the yearly life of this insect is yet remaining undiscovered and a subject of speculation and conjecture.

I am inclined to rank the Curculio or Plum weevil as the most important and worst injurious insect which we have in our country. Although the Wheat midge is at the present period causing a much greater amount of pecuniary loss than this insect, I cannot but think that its career will be analagous to that of its predecessor, the Hessian fly, and that it will therefore in time become so fully naturalized and mastered by its parasitic destroyers, that it will cease to be the formidable evil which it now is. Unlike the Wheat midge, the Curculio is a native insect of our country, which has now been known upwards of a century, during all of which time it appears to have gradually multiplied and increased its forces, without any cessation or intervals in its ravages. At first, in the correspondence between the botanists Collinson and Bartram, in the year 1746, it is spoken of as totally destroying the nectarines in and around the city of Philadelphia, whilst the plums it is said, were but slightly molested by it. But after a time, it took the plums also. As an evidence of its steady progress and increase during the past forty years, I may state the fact, that in my boyhood, the wild plum trees in my own vicinity were often well filled with fruit. But though thrifty trees are still growing in several of the same places, I have never since that time seen a ripened plum upon any of them. And now it has become so multiplied that the plum no longer suffices to accommodate it, and it therefore attacks our cherries and apples also, and a large portion of these are every year blighted and destroyed by it.

As already intimated, this insect and its habit of destroying young plums, has been known in our country, for more than a century. And so formidable an evil is it, that communications without number, in relation to it

and remedies for its destruction, have appeared in our agricultural periodicals and other publications. You would hence think that everything relating to the habits and economy of this insect has been observed and made known to the public. This, however, is very far from being the case. Notwithstanding the volumes that have been written upon it, we do not to this day know where the *Curculio* lives and what it is doing, during three quarters of the year. All that is currently known respecting this insect is substantially as follows:—That it is a small grayish brown beetle, which makes its appearance on plum trees when the young fruit is about a third or half grown—cutting a curved or crescent-shaped slit upon the side of this fruit and dropping an egg into the wound—from which egg a small white worm hatches, which burrows in the fruit, causing it to wilt and fall from the tree—whereupon the worm crawls into the ground, to repose two or three weeks during its pupa state, when it comes out again, the latter part of July, a beetle like that which six weeks before laid its eggs in the fruit. What becomes of it from this time till the next June is wholly unknown. And that it breeds elsewhere than in the young fruit, though stated by some, is doubted and denied by others.

My own observations lead me to believe that what is currently known and supposed to be the main and essential part of the history of this insect, is in reality but a small part of its history—a mere incidental act—an episode only, of its life and operations;—and if there was no young fruit whatever, this creature would continue in existence without being sensibly discommoded by the want thereof. I will therefore proceed to state the facts relating to this insect, so far as they are at present known to me, and the inferences to which these facts lead me.

First, however, let us notice the insect itself. On taking one of them in hand and closely inspecting it, it is observed to lie perfectly still and motionless as though it were dead, and is seen to be a small, hard, uneven or knobby beetle, shaped somewhat like a pear, its anterior part being narrower than the main part of its body. It varies greatly in its dimensions, some of the males or smallest individuals being but half as large as some of the females; its medium size being somewhat less than a quarter of an inch in length. It is of a gray or rusty brown color, varied more or less in different specimens with spots of white, ochre yellow and black, in particular, showing a shining black spot on the middle of its back with a white spot immediately back of it. Hanging down conspicuously from its forward end like the trunk of the elephant, is seen a slightly curved beak or bill, of the same length and thickness as the thighs of the legs. This beak is an appendage which belongs to all insects of the weevil kind, and distinguishes them from all the other beetles or hard shelled insects. Being thus a true weevil this insect has often been termed the “plum weevil,” and it is to be regretted that this has not become its current designation, it being so much more definite and expressive than the name “*curculio*,” which is merely the Latin synonym of our English word weevil, and is hence applied in science as the family name of the whole group to which this species pertains.

Next, at what time do these beetles come abroad, and where do we find them? I know not how many articles in our agricultural periodicals I can refer to, reciting the success of different remedies, which were applied, "when the *Curculio* first began to appear"—yet not one of them specifying *the date*, whereby others might know when the time has arrived to look for it.

Undoubtedly to the south of us, in Pennsylvania and Maryland, this, like all other insects, will come abroad somewhat earlier than they do here in New-York. And everywhere, they will vary somewhat with the backwardness or forwardness of the season, in different years.

In my own vicinity, fifty miles north of Albany, this beetle has been found, as early as the beginning of April, though it is not usually met with till about the middle of May; and in a week or ten days afterwards it becomes common. It is then found standing or slowly walking upon the trunk and limbs of the plum, cherry, apple, the wild thorn-apple, the butternut, and doubtless on some other trees—though I name no others, not being certain but it was accidentally present in other situations where I have captured it. The collector of insects will notice, that the specimens he finds on butternut trees are always larger in size than those he finds on cultivated fruit trees—indicating that they have been better fed during the larva or growing period of their lives. And from this time, onward, till cold weather returns, we continue to find these beetles abroad, the whole season through. Late in autumn, upon the flowers of the Golden rod, they may be met with as plenty as at any earlier period of the year.

And next—what do these insects do? As we have just stated, they come abroad in full force, soon after the middle of May; and it is some two or three weeks after this, or about the tenth day of June, that the young fruit becomes sufficiently advanced to answer their purposes. They then fall upon it, to deposit their eggs therein. They are decided epicures, being most fond of the choicest varieties of our fruits; hence the nectarines and all the best kinds of plums are most sure to be destroyed. But as already stated, their numbers are now so excessively multiplied, all over our country, that the plums fail to accommodate but a portion of them. Others, therefore, invade the peaches, pears, apples and cherries, and others still attack the wild thorn apples, making the same crescent-shaped wound in all these fruits.

It is in allusion to this crescent-shaped mark that this weevil is frequently termed the Little Turk—as it appears to delight in seeing this symbol of Mahometanism everywhere inscribed—as though the little imp was aware how annoying the sight of it is to us "Christian dogs."

This mark is scarcely the tenth of an inch in length, but is very distinctly to be seen wherever it occurs upon the surface of the young fruit. In apples, however, which are quite small and have a thin wooly coating and are increasing rapidly in size when they receive this wound, it in a few days becomes so dried and healed that it usually appears to the eye as a mere discolored speck, which is probably the reason why it has been so

much overlooked in this fruit. This mark is cut by the jaws of the insect, which are exceedingly small and are placed in the end of the long beak or trunk of which we have spoken. And in addition to this crescent-shaped slit, the *Curculio* wounds the fruit by drilling holes therein with its beak, resembling punctures made by a coarse pin or needle. One or more of these punctures may be seen upon almost every fruit which it invades. It is probably for feeding upon the juicy pulp of the fruit that the insect bores these small holes in it; and even where no crescent-shaped slit occurs, these perforations may be noticed, causing hard nurlly dents to be formed in the fruit which would otherwise be smooth and fair.

Usually only one of these crescent marks is made upon a plum or apple, though sometimes two, three or more may be found. A single egg is dropped in each of these curved slits, and with its beak the insect crowds the egg deeply into the bottom of the wound. From this egg a small white worm or grub hatches, which is destitute of feet, like the larvæ of all the other weevils, and is about four times as long as broad, being thickest in its middle, and with a small, shining, brownish yellow head. This worm penetrates inward to the core of the young fruit, and there feeds around the stone or seeds, excavating quite a large cavity, which is partly filled with small brown grains, the castings of the worm.

From the attack of this worm, the plum, the apple, the pear and peach, wilt and fall to the ground, whilst the cherry and thorn-apple do not wither but continue to grow and ripen, though so wounded, knotty and deformed, that the fruit is worthless.

And here let us pause for a moment, to notice one of those curious paradoxes, with which the student in the works of nature is so frequently meeting.

A person, on being informed that of the two stone fruits, the plum and the cherry, the one perishes and the other lives—of the two pomaceous fruits, the apple and the thorn-apple, the one perishes and the other lives, when invaded by this worm—I say, a person, on being informed of these facts, would at once say, it is the smaller of these fruits, it is the cherry and thorn-apple, that wither and die when attacked by this worm, whilst the larger fruits, the plum and apple, will feel the same injury less, and will survive the wounds that kill the smaller fruits. But lo! exactly the reverse of this is the fact. It is the small cherry and thorn-apple that live and ripen on their stems; it is the large plum and apple, and also the peach and pear that wither and fall from the tree! And on coming to consider this anomaly more fully, we clearly perceive that it is necessary that these things should be ordered and arranged just as we find them to be. The quantity of pulpy substance in the larger fruits is sufficient to feed the worm within them, till it reaches maturity; whereas, should the smaller fruits wither in the same manner, the worm within them would die. It is, therefore, necessary that they should continue to grow, to elaborate the amount of sustenance which the worm requires to bring it to maturity.

But why it is that in these several fruits effects so dissimilar result from the

same cause, these effects, too, exactly the reverse of what we should expect, we are wholly unable to explain. I can only resolve it into this, that in each of these cases, the Author of nature has decreed that it shall be so, and therefore it is so.

Even though in a more advanced state of science, the vegetable pathologist should be able to show certain peculiarities in the physical constitution of these trees, whereby it will be explained why it is that the irritation produced by the gnawing of this worm is speedily fatal to the one fruit, and not at all so to the other, it will only carry us one step further back and lead to the enquiry, How came these trees to possess their respective constitutions? Why did not the peculiarities of the cherry happen to be given to the plum, and thus produce a discord instead of that harmony which we now see?

And thus, wherever we fix our look in the wide domain of nature—whatever page we open in her “book of wondrous secresy,” we perceive unmistakable evidence, that even in all its minutest details, the vast frame-work of creation has been arranged by a hand that was omnipotent, that hand guided by an intelligence that was infinite.

But to return from this digression. Any person on inspecting a large, thrifty plum tree at the commencement of June—on seeing the profusion of small young fruit which is everywhere interspersed among the leaves, would deem it all but impossible for an insect to devastate that fruit to the extent that the curculio does. He would think that, here and there, at least, a plum hid among the foliage, or projecting far out upon the ends of the slender twigs, would elude the search of this insect, and thus remain to ripen upon the tree. But, I judge from accounts it is the same all over the country, that it is within the sphere of my own observation—although the trees are perfectly healthy and vigorous, richly clothed with verdure year after year, we never see a ripened plum upon them, except where special care is taken to combat this intruder.

And not only this fruit, but (what many persons are wholly unaware of) a large portion of our apples are also blighted by this same pest. I am persuaded it is one of the principal causes why our orchards at this day are so much less productive than they were a half century ago. To obtain a correct idea of the intolerable evil which this insect is in our country, I hope every one who now hears me, if he has not already particularly noticed the sad spectacle, will bear it in mind next 4th of July, or within a few days of that time, to walk to the plum trees and some of the orchards in his neighborhood. You will find the ground under many if not all the trees literally covered with the wilted young fruit that has fallen from its having been blighted by this insect. Could but a fourth part of what is lying on the ground have remained upon the trees to ripen, it would be such a yield from them, as for a cycle of years we have never had and have ceased to expect.

On cutting open these withered plums and apples you will find the same worm in the one as in the other, or if this worm has left a portion of the

fruit, its track will still be seen therein, demonstrating that the falling of the whole of the fruit, from both kinds of trees, has been occasioned by the same cause.

It is during the early part of July that these worms are leaving the fruit and entering the ground. But some are found still quite small, after others have got their growth and evacuated the fruit. Hence a considerable time elapses, two or three weeks probably, during which one and another of these larvæ in the fruit are coming to maturity and entering the ground.

They remain in the ground, reposing, in their pupa state, about three weeks. Hence it is during the latter part of July that the most of them complete their transformations, and come out again in their perfect state.

Thus, in from six to eight weeks from the time the egg is deposited, this insect gets its growth, and becomes a beetle of the same kind as its parent.

We thus have these insects completing their transformations and all coming abroad again in their perfect state the latter part of July. But there is now no young fruit for them to resort to. And the question arises, What do they now do, and what becomes of them from this time till young fruit again appears the following year? Where do they secrete themselves to pass the winter, and in what stage of their lives are they at that time?

Our best authorities at this day, give us as their opinion on this subject, that some of the larvæ which are retarded in completing their growth, so that they do not leave the fruit and enter the ground till the latter part of July or later, remain in the ground in their pupa state through the autumn and winter, to produce the beetles which appear the following spring. There are so many improbabilities connected with this view of the case, that I am surprised that an author so intelligent on these subjects, as was the late Dr. Harris, gives countenance to this as his opinion. Let us briefly look at this hypothesis. The temperature of the earth through the month of August is greater, the ground is then warmer than it is in July. There is no probability, therefore, that an insect whose transformation under ground is completed in three weeks in July, can remain in the earth a longer period in the month of August. Least of all is it to be supposed that it can remain there unhatched through all the warm weather of that month and autumn.

Again, we know that nearly the whole generation of these insects that is nurtured in the young fruit, reaches maturity and comes abroad the latter part of July. Now, is this vast army of these creatures merely an abortion—brought forth only to perish? Is the existence of this species left to the mere accident of a few individuals happening to be retarded beyond the usual time in entering the ground, and therefore remaining in it till the following spring? This would be an anomaly, wholly unlike anything which we meet with elsewhere in this department of nature's works.

Without stopping to notice other views that have been advanced on this subject, it may be observed, that the fact that these insects come abroad in the spring in full force, some three weeks before the young fruit is adapted to their use, and that after the young fruit is gone, they are

still abroad as numerous as before, the presumption becomes very strong, that they must have other places for cradling their young, in addition to the fruit. And the enquiry thus arises, whether the curculio is known to breed elsewhere than in young fruit. To this comes the reply, that there is one other situation in which it is well ascertained they do breed, with avidity, to wit, in those singular excrescences on plum and cherry trees, called the black knot. And as the curculio has so often been said to cause these excrescences, and the opinion is still entertained by many persons that they are produced by some other insect, if not by this, I may here turn aside to give some account of this remarkable disease—since, to ascertain whether it really was caused by an insect or not, I have examined it more closely, perhaps, than has ever been done by any other person.

This black-knot excrescence is a disease peculiar to the plum and cherry trees in this country. It is a large, irregular, black, wart-like excrescence, which grows upon the limbs, causing the death of all the limb above it, and extending down the limb farther and farther every year till the whole branch is destroyed, other limbs at the same time becoming affected in the same manner, and also the limbs of other trees in the vicinity. If it is neglected, it in a few years kills the tree.

This disease commences upon the small limbs, the wood of which is but a year or two old. It is recognized at first by a slight swelling of the bark at a particular point, on the upper side of the limb, which begins in autumn and remains stationary through the winter. When the sap begins to circulate in the spring this swelling increases, rupturing the cuticle or thin outer skin of the bark, and continuing to grow and puff out till in June some inches in length of the limb at the place affected is three or four times its diameter elsewhere. The bark and a portion of the wood under the bark are the tissues involved in this disease, both the bark and woody fibres being changed into a spongy substance, but not at all juicy like the fruit of a tree. This spongy substance is of a pale yellow color when growing, changing to coal black when it is mature; and then a minute black fungous plant, resembling the head of a pin grows upon its surface. You will see, on looking at these black knots, that their whole surface is covered and crowded with little smooth black granules, which are the fungus plant alluded to. They are a species of the genus *Sphæria*, and are described by that profound botanist, the late Rev. L. de Schweinitz, under the name *Sphæria morbosa*. It is a curious fact that the surface of these excrescences, when mature, are always covered with this plant, which never grows, or at least has never been found, in any other situation.

There has been much speculation as to the cause and the true nature of these excrescences, they are so unlike anything else with which we are acquainted. Most persons suppose them to be of insect origin. The larvæ of the curculio are almost always found in them, and these larvæ consume nearly all of the spongy matter of the warts, but do not touch the little fungus growing on their surface, which remains, forming a kind of shell, after the whole inside is devoured. But as these excrescences are sometimes found

wholly free from the curculio larvæ and all other worms, it is obvious they are not the cause of their growth. Others have supposed they were analogous to the galls or swellings which we see on the limbs of oaks and other trees, and have even reported that a gall-fly is to be seen at times on these excrescences. But always in galls, one or more hard seed-like bodies are found in the centre, in which the young of the fly producing them is inclosed. Hence I know from their internal structure that these are not excrescences of that kind; and what the small fly is that has confirmed some persons in this error, we shall shortly see. Others still have maintained that it was a wound in the bark, made by the puncture of an insect, that caused this disease, some saying the remains of this puncture are often to be seen, when the first slight swelling in the bark begins. Yes, I have seen it. It is exactly as they state. Only it is not the puncture of an insect. It is one of the natural glands or pores in the bark, somewhat altered in its appearance, and rendered more conspicuous in consequence of the swelling. And it gives me the opinion that it is in this pore that the seeds of the disease are planted, or in other words, the contagion or poisonous matter which causes the disease here finds an entrance to the inner bark, which, thus tainted, begins to swell immediately around this pore.

I will not detain you to notice several other conjectures that have been presented to the public respecting the cause of this disease. Suffice it to say, that having now carefully examined these excrescences, from their first commencement, onward through their subsequent growth, I am prepared to say, with the fullest confidence, that the microscope shows nothing whatever about them, externally or internally, indictating that an insect has anything to do with causing them.

It has also been supposed that these excrescences were a peculiar species of fungus growing upon the limb; and there are some things about them which favor this view. But what is a fungus? To express it in familiar language—it is a body which grows, and forms its own substance, distinct from and independent of the body in which it takes root and from which it draws its sustenance. Now these black-knots are not such a growth. They are merely a change in the texture of the natural parts of the limb. And thus we arrive at the conclusion, that these excrescences are not of insect origin, and are not a vegetable fungus, but are properly a disease of these trees, whereby the natural tissues, the bark and wood, become softened and swollen, at the places affected.

In many respects this disease appears to be analogous to the cancer in the human body. And the most approved remedy for it, is the same as in that disease. It is *excision*. Wherever one of these swellings is discovered upon a limb, the limb should immediately be cut off, so far below the swelling as to be certain we remove every taint of the disease.*

* It is worthy of note, that in the discussion which occurred on the close of this lecture, Hon. A. B. Dickinson remarked that the black-knot only attacks trees growing in a wet sub-soil, and if this soil be suitably underdrained, whereby, to adopt his expressive phrase, the trees

But, to return again to the *Curculio*.

We have the fact well authenticated, that this insect breeds in these black-knot excrescences, with about the same avidity that it does in young fruit—notwithstanding these substances are so unlike each other.

But the black-knots, like the fruit, have become too far advanced towards maturity, by the middle of summer, for these insects to resort to them to deposit their eggs therein. And the question thus returns upon us—What does the whole generation of these insects, which is bred in the fruit, and which comes out of the ground in their perfect state the last of July, now do, when there is neither young fruit, or black-knots to accommodate them?

Upwards of fifty years ago, Rev. F. V. Melsheimer, who was the best acquainted with insects of any man in our country at that day, stated that the *Curculio* was bred in the bark of peach trees, as well as in the fruit—but without giving any of the circumstances whereby he had learned this fact. And though no observations in confirmation of this statement have since been made public, that I am aware, I am strongly of the opinion that it is correct—and that these insects resort to the bark of different fruit trees to deposit their eggs, when they can find no young fruit to meet their wants.

Four winters since, Mr. L. B. Langworthy, one of the well known nurserymen at Rochester, N. Y., sent me a piece of pear tree limb, to examine a kind of scurf on the bark, which I found to be produced by a minute bark-louse, which I have described under the name of *Aspidiotus furfurus*. As I was passing the magnifying glass over the bark, I detected therein numerous curved incisions, of the same length and shape with the crescent-shaped marks made by the *Curculio* on the surface of fruit; and on the convex side of these incisions, the bark was elevated in a little, smooth blister-like spot. On opening these spots, a small cavity was there found, situated immediately under the cuticle or outer skin of the bark, in which, what appeared to be from four to six minute footless worms or maggots, were lying in a row, side by side, their tails towards the slit in the bark, and their mouths at the opposite edge of the cavity, ready to eat their way onwards in the bark, when the warmth of spring returned to awaken

will not have wet feet, none of these knobs will make their appearance upon them. On casting over in my mind the different localities where I have observed this malady, I am inclined to think it has been most prevalent and inveterate where either the surface or subsoil was of the character stated. But I have noticed some of these knots on thrifty plum trees in the garden of Hon. John H. Boyd, Whitehall, which was originally a naked rock sufficiently inclined for most perfect drainage, upon which a mellow loam has been drawn, to a depth of two to four feet. A. J. Heermance, Esq., of Rhinebeck, has also communicated to me the history of a Frost gage growing more than forty years in his grounds, and which had always been perfectly healthy until six years ago, when the black-knot attacked it. The affected limbs were promptly and perseveringly cut off, but without avail, the disease reappearing, till the whole tree was finally cut down, and yet last season the vigorous young sprouts from its roots showed the same malady clinging to them. It hence appears that though there is probably much truth in Mr. Dickinson's theory, it does not embrace the whole truth. The two cases here related favor the view of Elisha Dorr, Esq., of Albany, that it is a rapid, exuberant growth of the trees that is the foundation of this and several other maladies.

them again into life. It was evident that the curved slit in the bark had been cut by an insect, which had dropped a half dozen eggs therein, the worms from which had fed on the outer layer of the bark directly under the cuticle, all eating in the same direction, and thus excavating the little cavity in which they were lying. They had travelled but little more than the length of their bodies, when cold weather came on to arrest their operations, for the time. The worms were so very minute—only 5-100ths of an inch in length—that no opinion could be formed from them as to what insect they were. But the size and shape of the incisions, together with the tree in which they appeared, suggested to me that they were the *Curculio*—and consequently that this insect commits its eggs to the bark, in which it lies, in its larvæ state, during the winter, to complete its growth and produce the beetles which make their appearance the following spring.

I will state one fact more in confirmation of this view, that these insects are reared in the bark. The *Curculio* is so frequently met with on butternut limbs, as to render it altogether probable that this tree is as much a favorite abode for it as is the plum and apple. And the larger size of the specimens found on the butternut, as has already been remarked, indicate that they have been better fed during their larva or growing state. This difference in size is so notable that some collectors have placed such specimens in their cabinets, as a distinct species. But, as many other weevils vary in their size to an equal or even greater extent, this cannot be regarded as a valid ground for regarding them as different. Now as no pulpy succulent fruit or other analogous substance occurs upon the butternut, it is a strong indication that this insect consigns its eggs to the bark of the limbs—which in this tree is remarkably thick and soft, its texture approaching the spongy substance of the black-knots.

Against this view that the *Curculio* is nurtured in the bark of trees, and there passes the winter in its larva state, it has been objected that it is contrary to all analogy, to suppose that an insect which feeds on young fruit should also feed on a substance so dissimilar as the bark of trees. But those who make this objection assuredly have but a limited knowledge of the habits of insects, and are unaware how diversified those habits often are, to accord with the different circumstances in which the insect finds itself placed at different times. One of the European insects which is most nearly related to our *Curculio*, both in its form and in its habits, we are told by Kollar, deposits its eggs in the new shoots of the plum when it cannot find fruit for this purpose. Moreover the dry spongy matter of the black-knot, is as much unlike the juicy young fruit as is the bark.

To sum up this subject, then—We see this beetle coming abroad with the first warm days of spring, individual specimens of it being found the last of March; and soon after the middle of May they appear in full force, and continue to be common from that time till the end of the season. As it requires but six or eight weeks for the egg to become a mature beetle, there are probably three or more generations of it every year—one individual after another coming to maturity and laying its eggs, whereby a con-

stant succession of new individuals are coming forth as the old ones disappear, through the whole season. They are committing their eggs to the bark of the different trees to which they resort, we suppose, at all times. And when the young fruit comes forward, its pulp furnishing a more tender and delicate repast to their young than the bark does, they for a time eagerly resort to it, to deposit their eggs therein. When the cold of autumn arrives it overtakes them in all stages of their growth. Some of the beetles newly hatched and with their stock of eggs not disposed of, it is probable crawl under stones and clods of earth, or among fallen leaves, or in the crevices of the bark of trees, and similar sheltered situations, and there lie torpid during the winter, as do many other species of the weevil family, to come out upon the first warm days of March and April. Others it is probable, when cold weather arrives have recently entered the ground to pass their pupa state. These pupa will remain in the ground through the winter awaiting the warmth of spring to enable them to complete their transformations. Others still are in their larva state, in all the different stages of their growth, in the bark, as we suppose, and also in late ripening thorn-apples, as we know. I may here state a fact which has not yet been mentioned. After the frosts of autumn have become so severe as to suspend all insect life for the season, the ground beneath some of our thorn bushes is found covered with fallen fruit, in which curculio worms are sometimes met with, these worms being then of all sizes. Such worms will no doubt remain torpid in the fruit through the winter, and awake to life the following spring, when, those that are full grown will probably enter the ground and complete their transformations, and those that are small will probably perish, as the fruit after having been frozen will scarcely nourish them onwards to maturity.

In view of the fact that our injurious insects are usually restrained from becoming excessively multiplied by their parasitic destroyers—other insects which are their most inveterate foes—you will be inclined to enquire, why do not the destroyers of the curculio fulfill their office better, and prevent it from being so exceedingly numerous and destructive.

This brings me to remark, that notwithstanding all the observations that have been made upon this insect, no other insect has ever been discovered, destroying this species and repressing its numbers, till within the past six months a species of this kind has been brought to light.

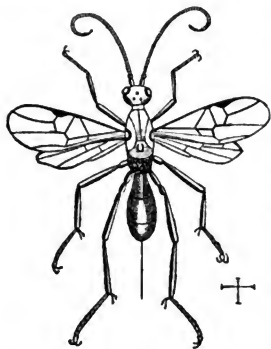
Mr. D. W. Beadle, of Saint Catharines, Canada West, sent to the Country Gentleman, specimens of a small four-winged fly, the history of which, as given in an accompanying letter, was as follows:—

Early in June, observing numerous worms in the young black-knot excrescences on the plum trees, he placed several of these excrescences in a jar of moist sand, tying some thin muslin over the top of the jar. Early in July, curculio beetles began to make their appearance in this jar, and about a fortnight later, these flies began to appear in the jar also, and specimens of both the beetles and the flies continued to come out, till the 10th of August, the date when this letter was written. He suspected it to be a

gall-fly, and that if so, it might throw some light upon the cause and true nature of these excrescences. And it is altogether probable that this is the same insect which in some of the published accounts has been referred to as a gall-fly that is sometimes seen upon these black-knots, and was conjectured to produce them, as other flies of this kind produce the swellings on the limbs of oaks and other trees.

On examining these flies, I saw they were a parasitic insect, wholly different from, though having many points of resemblance to the gall-flies; and it having never been described, I gave it the name of the curculio parasite (*Sigalphus curculionis*) in an account of it, published in the Country Gentleman and also in the Albany Cultivator, in October last.

This insect, a magnified figure of which I present for your inspection, resembles a winged ant in its appearance.



CURCULIO PARASITE, greatly magnified.
The cross lines indicate its natural width and length.

It is a small black four-winged fly, with bright orange-yellow legs, its hind feet and shanks being black. One of its most peculiar marks, (as you will notice on the figure) is, that the abdomen or hind body has only three joints, instead of six or seven, the number we usually see in insects. You will also notice, projecting from the end of its abdomen, a bristle-like sting. It is with this implement that it pierces the fruit or the black knot and punctures the skin of the curculio worm lying therein, at the same instant inserting an egg under the skin,

the worm from which egg feeds in the interior of the curculio worm till it causes its death. Thus each one of these flies punctures and destroys probably more than a hundred curculio worms. It is therefore fervently to be hoped that this insect may multiply and extend itself over our land, rendering us a service which no other instrumentality can accomplish.

It remains for us to consider the *Remedies* by which this insect may be opposed, and the fruit saved from its ravages.

In glancing over our agricultural publications, quite a number of these will be met with, none of which have gained the public confidence, and which it is therefore unnecessary to notice.

The remedy which has been much the most extensively resorted to, is one which has long been recommended and practiced against insects of similar habits in Europe, and which was brought into public notice in this country by the highly respected David Thomas, lately deceased. It was modestly proposed by him as a partial remedy, which might be resorted to with advantage until something more effectual is discovered.

It is the habit of this, as of all weevils and several other insects, when

alarmed or menaced with danger, to drop themselves suddenly to the ground, and there lie for a short time perfectly still and as though they were dead. The design of Nature, in giving these insects this habit, appears to have been, chiefly to protect them from being devoured by birds. A bird, in alighting upon a small limb, and hopping along it in search of insects thereon, imparts a slight jar to the limb, whereby all the insects on the limb are apprised of the approaching danger, and by instantly dropping to the ground and there lying perfectly still, they escape the impending destruction.

In view of this habit of the *curculio*, Mr. Thomas, as most of you are doubtless already aware, recommended the spreading of sheets under the tree, and then striking the trunk of the tree with a club or mallet, with a blow sufficiently heavy to give the whole tree a sudden jar—and then gathering up the insects that fell upon the sheets and destroying them—this operation to be repeated daily, or as often as the number of insects obtained showed its utility.

Some have been well pleased with the result of this remedy; others have been not at all satisfied with it, being unable to perceive that any good resulted from it, only a part of the insects dropping themselves when the tree is thus jarred—whilst the trees are much injured by this repeated striking, bruising and loosening their bark. Certain it is that this remedy is far from being so efficacious and reliable as to meet our wants in the premises.

A remedy which is at present receiving much notice, and is extensively on trial, is that of Mr. Cummings, of the N. Y. Observer, in which paper it has been strongly recommended for two season past—Mr. Cummings having found it perfectly successful, on a trial of it through two years previous to its publication. He mixed four ounces of sulphur with a pound of whale oil soap, and added this to four gallons of lime water, to which an equal quantity of tolerably strong tobacco water was then added. The leaves of the plum trees were drenched with this mixture, from a garden syringe, as soon the first mark of the *Curculio* was discovered on the fruit; and should rains occur within three weeks thereafter, sufficient to wash this from the leaves, it is to be renewed.

This remedy is not altogether so new as Mr. Cummings probably supposes it to be—for in the first published accounts of this insect over a hundred years ago, Collinson recommends to Bartram, in the homely language of that day, to squirt tobacco water among the leaves of the trees to drive this insect from them.

We doubt not the whale oil soap is a valuable addition to the tobacco water. But whether the lime renders the mixture any more efficacious than it will be without it, we are inclined to doubt. And as to sulphur, although it has long been in popular repute as an antidote to all kinds of insects, we have yet to learn that it possesses any efficacy whatever in repelling or destroying any of this class of beings, save only the itch mite. Certain I am, that to the common apple tree caterpillar sulphur is more

beneficial than injurious—these caterpillars when their food is strongly impregnated with this substance, being more healthy and vigorous and coming to maturity a third sooner, than when it is not thus seasoned. My experiments on this subject, and their results, will be found fully stated, in the account of the apple tree caterpillar, given in my Second Report on Noxious Insects.

It is my opinion, therefore, that tobacco water with whale oil soap added to it, will be found equally as effectual as the more complex mixture of Mr. Cummings. One or the other of these as the testimony now stands, promises to be the most efficacious of any remedy yet brought to public notice.

One other topic connected with this branch of the subject merits to be adverted to before I leave this discourse. There is strong testimony to the fact that where trees are standing upon the margin of creeks and ponds with their branches extending over the water, they are not molested by this insect. A neighbor of mine, Peter Reid, Esq., who has an ardent predilection for observing our birds and their habits, and whose rambles in this pursuit have rendered him familiar with every part of the woodlands in his vicinity, informs me of a particular wild plum tree growing beside and leaning partially over a stream of water to which he has repeatedly repaired at the season when the plums are ripe, always finding it well filled with fruit, whilst a number of other trees are known to him, scattered about the woods, upon none of which has he ever been able to find a ripened plum. It hence appears that this insect possesses sufficient intelligence to be aware that if it commits its eggs to fruit which in falling will drop into water, its young will thereby be drowned; and it hence avoids the trees where this casualty will be likely to occur. It is therefore recommended to every one who has a stream or a pond of water upon his grounds, to plant his plum trees along its margin. And this fact has suggested a kindred measure, namely, the placing of water in large shallow tanks or tubs under the trees. Some limited trials of this kind have been mentioned to me as having appeared to be successful. But neither this nor any other remedy can be recommended and resorted to with perfect confidence, until its efficacy has been fully established by a carefully conducted series of experiments, or by the combined experience of several persons extended through a term of years.

TREASURER'S REPORT.

LUTHER H. TUCKER, *Treasurer, in account with the New York State
Agricultural Society.*

1859.	Dr.
Feb'y 9. To cash on deposit in Albany Exchange Bank, per last report,.....	\$2,650 93
To cash for memberships, at annual meeting,.....	54 00
To cash for life memberships,.....	90 00
Mar. 25. To cash for use of tent, 1858,	16 00
To cash for Dr. Fitch's salary, for one quarter,	250 00
July 15. do do do	250 00
Sept. 26. To cash for life memberships,	220 00
Oct. 3. To cash, Albany contributions to fair expenses,....	1,200 00
7. To cash receipts at Albany fair,.....	\$18,133 45
Counterfeit and discount,	22 12
	18,111 33
To cash for memberships, not included in above, ...	268 00
18. To cash, Dr. Fitch's salary, one quarter,.....	250 00
To cash, life memberships,.....	60 00
1860.	
Jan. 6. do do	40 00
24. To cash, State appropriation,.....	700 00
To cash, Dr. Fitch's salary, one quarter,	250 00
	\$24,410 26

1859.	Cr.
By cash paid,—	
Premiums at winter meeting, as per schedule A,	\$691 00
Expenses, winter meeting, " B,	70 56
Salaries and traveling expenses, including Dr. Fitch's salary, (\$1,000,) as per schedule C,	3,779 71
Expenses library and museum, " D,	181 10
Premiums, &c., of previous fairs, " E,	547 14
Postage account, " F,	155 93
Incidental expenses, " G,	175 81
Printing, advertising, and stationery, " H,	837 90

Carried forward, \$

Brought forward,.....	\$	
Expenses annual fair, viz:		
Mayor's bill, police expenses,.....	\$491	00
Detectives, police, day and night watch, magistrates, &c.,.....	693	25
Gate keepers, partly as night watch,.....	358	00
Other guards, extra police, gate keepers, and constabulary expenses,.....	385	50
		<hr/>
	1,927	75
Guards and assistants in halls,.....	235	00
Erecting extra structures,	240	00
Fittings in Mechanics' Hall,	347	50
Steam plow exhibition,.....	350	00
Refreshments for judges, &c.,	651	00
Clerks in business and ticket offices,.....	621	00
Superintendents and assistants,.....	889	52
All other expenses,.....	708	07
		<hr/>
Total, as per schedule I,	5,969	84
Total premiums and premium expenses, K,	6,115	20
Survey of Onondaga,.....	200	00
		<hr/>
	\$18,724	19
By cash on deposit in Albany Exchange Bank, Albany, Feb. 6, 1860,.....	5,686	07
		<hr/>
	\$24,410	26
		<hr/>

LUTHER H. TUCKER, *Treasurer.*

There remains due by the Society an unliquidated claim of the Albany local committee, which, when paid, will reduce the balance now in the treasury.

We hereby certify that we have examined the account presented, and the vouchers accompanying the same, and find the same in all respects just and true.

A. B. CONGER, <i>President.</i>	
B. P. JOHNSON, <i>Secretary.</i>	
EDWARD G. FAILE,	} <i>Finance Committee.</i>
JAMES O. SHELDON,	
C. S. WAINWRIGHT,	

AWARD OF PREMIUMS.

NEW YORK STATE FAIR, ALBANY, OCTOBER 4, 5, 6, 7, 1859

CLASS I.—CATTLE.

No. 1. SHORT-HORNS—BULLS.

Best bull, 3 years old and upwards, J. R. Page, Sennett, Cayuga county, "Hiawatha,"	\$25
Samuel Thorne, breeder, Silver Medal.	
2d best, Wood & Eastman, Woodville, Jefferson county,	15
3d best, Simeon Leland, New Rochelle, Westchester county, "Farnsley,	5
Best bull, 2 years old, N. J. Becar, Smithtown, Suffolk county, Second Duke of Oxford,"	20
2d best, A. M. Underhill, Clinton Corners, Dutchess county,	10
Third best, W. M. Bullock, Normanskill, Albany,	5
Best bull, 1 year old, Samuel Thorne, Thornedale, "Second Duke of Thornedale,"	15
2d best, Samuel Thorne, Thornedale, "Third Duke of Thornedale, ..	10
3d best, William Lape, Crescent, Saratoga county, "Lape's Hero," ..	5
Best bull calf, John B. Garrett, Salina, Onondaga county, "Pilot," ..	5
2d best, D. T. Vail, Troy,	3

Discretionary.

Wm. H. Slingerland, Normanskill, Short Horn bull calf, "Morgan," S. M.

No. 6. SHORT HORNS.—BULLS (IMPORTED).

Best bull, 3 years old and upwards, Samuel Thorne, Thornedale, "Grand Turk,"	\$25
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Discretionary.

Hurst, Slingerland & Bullock, Albany, imported bull "Neptune," Diploma.

No. 1 A. SHORT HORNS.—COWS.

Best cow, 3 years old and upwards, Samuel Thorne, Thornedale, Dutchess county, "Mrs. Gwynne,"	\$25
Samuel Thorne, breeder, Silver Medal.	
2d best, Samuel Thorne, Thornedale, Dutchess county, "Fornarina," ..	15
3d best, W. H. Slingerland Normanskill, "Minnie,"	5

Best heifer, 2 years old, Samuel Thorne, Thornedale, "Favorite," ..	\$20
2d best, Samuel Thorne, Thornedale, "Gertrude,"	10
3d best, Wm. Kelly, Rhinebeck, Dutchess county, "Myrtle,"	5
Best heifer, 1 year old, Samuel Thorne, Thornedale, "Second Lady of Oxford,"	15
2d best, Samuel Thorne, Thornedale, "Princess of Oxford,"	10
3d best, Wm. Kelly, Rhinebeck, "Miss Wiley 8th,"	5
Best heifer calf, Hurst, Slingerland & Bullock, Albany, "Florence,"	5

NO. 6. SHORT HORNS—COWS (IMPORTED).

Best cow, 3 years old and upwards, Samuel Thorne, Thornedale, "Lalla Rookh,"	25
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NO. 2. DEVONS—BULLS.

Best bull, 3 years old and upwards, J. J. Freemyer, Fulton, Schoharie county,	25
J. J. Freemyer, breeder, Silver Medal.	
2d best, E. Ottley, Phelps,	15
3d best, J. A. Carey, Clinton, "Orphan Boy,"	5
Best bull, 2 years old, E. G. Faile, West Farms, "Huron,"	20
2d best, C. S. Wainwright, Rhinebeck, "Sagamoor,"	10
3d best, Webb & Rogers, Watertown, "Neptune,"	5
Best bull, 1 year old, E. G. Faile, West Farms, "Cayuga,"	15
2d best, Joseph Hilton, New Scotland, "Empire 2d,"	10
3d best, O. Howland, Auburn, "Rover,"	5
Best bull calf, C. S. Wainwright, Rhinebeck, "Sachem,"	5
2d best, E. G. Faile, West Farms, "Powhattan,"	Trans. and 3

Discretionary.

J. J. Freemyer, Fulton, Schoharie co., bull calf, 7 months, ... Vol. Trans.	
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NO. 7. DEVONS—BULLS (IMPORTED).

Best bull, 3 years old and upwards, C. S. Wainwright, Rhinebeck, "Omer Pasha,"	\$25
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NO. 2 A. DEVONS—COWS.

Best cow, 3 years old and upwards, C. S. Wainwright, Rhinebeck, "Helena 7th,"	25
C. S. Wainwright, breeder, Silver Medal.	
2d best, T. Baker, Earlville, "Jenny Lind,"	15
3d best, C. S. Wainwright, Rhinebeck, "Helena 3d,"	5
Best heifer, 2 years old, Joseph Hilton, New Scotland, "Belle,"	20
2d best, E. G. Faile, West Farms, "Eleanor,"	10
3d best, E. Ottley, Phelps, "Matchless,"	5
Best heifer, 1 year old, E. G. Faile, West Farms, "Queen Anne," ..	15
2d best, C. S. Wainwright, Rhinebeck, "Helena 12th,"	10
3d best, C. S. Wainwright, Rhinebeck, "Helena 11th,"	5
Best heifer calf, C. S. Wainwright, Rhinebeck, "Helena 15th,"	5
2d best, Joseph Hilton, New-Scotland, "Grace,"	Trans. and 3

No. 7. DEVONS—COWS (IMPORTED).

Best cow, 3 years old and upwards, C. S. Wainwright, Rhinebeck,	
"Kate Kearney,".....	25

No. 8. HEREFORDS.

Best bull, 3 years old and upwards, Eli P. Gardner, Schoharie,.....	25
2d best, Ambrose Bowen, Medina, "Cayuga Chief,".....	15
Best bull, 2 years old, M. C. Remington, Sennett, "Consternation,"	20
2d best, Ambrose Bowen, Medina, "Don Juan,"	10
Best bull, 1 year old, E. Corning, Jr., Albany, "Washington,"	15
Best bull calf, Geo. Clarke, East Springfield, Otsego county,	5
2d best, M. C. Remington, Sennett, "Superior,"	Trans. and 3
Best cow, 3 years old and upwards, Ambrose Bowen, Medina, "Young Matchless,"	25
2d best, Ambrose Bowen, Medina, "Coquette,".....	15
3d best, M. C. Remington, Sennett, "Venus,".....	5
Best heifer, 2 years old, E. Corning, Jr., Albany, "Grace 2d,"	20
2d best, Ambrose Bowen, Medina, "Myrtle,".....	10
3d best, E. Corning, Jr., Albany, "Cora 3d,"	5
Best heifer, 1 year old, do, "Grace 3d,".....	15
2d best, do, do, "Cora 4th,".....	10
3d best, do, M. C. Remington, Sennett, "Stella,".....	5
Best heifer calf, Geo. Clarke, East Springfield, "Snowbank,"	5
2d best, do, do, do, "Geranium,"...Trans. and	3

No. 8. HEREFORDS (IMPORTED).

Best cow, 3 years and upwards, E. Corning, Jr., Albany, "Cora 2d,"	25
Best heifer, 2 years old, do, "Flora 2d,"	20

No. 4. AYRSHIRES.

Best bull, 3 years old and upwards, E. P. Prentice, Albany, "Dundee 7th,"	25
E. P. Prentice, breeder, Silver Medal.	
Best bull, 2 years old, John C. Hitchcock, Poughkeepsie, "Duke of Ayrshire,"	20
2d best, Samuel A. Curtis, Flat Brook, Columbia county,.....	10
3d best, S. D. Hungerford, Adams, "Robert Bunts,"	5
Best bull, 1 year old, do, "Highland Lad,".....	15
2d best, H. D. Hawkins, Albany,	10
3d best, S. D. Hungerford, Adams, "Tiger,"	5
Best bull calf, Jas. Thompson, Ballston Spa, "Country Gentleman,"	5
2d best, do, do, "Saratoga,"...Trans. and	3
Best cow, 3 years and upwards, Brodie & Converse, Rural Hill, Jefferson county, "Peach Blow,"	25
Hungerford, Brodie & Converse, breeders, Silver Medal.	
2d best, S. D. Hungerford, Adams, "Lilly Dale 1st,".....	15
3d best, James Thompson, Ballston Spa, "Fancy,".....	5
Best heifer, 2 years old, Brodie & Converse, Rural Hill, "Flora Temple,".....	20

Best heifer 1 year, old, S. D. Hungerford, Adams, "Lilly Dale 2d,"	\$15
Best heifer calf, Geo. W. Harcourt, Albany, "Minnie," 6 mos., . . .	5
2d best, S. D. Hungerford, Adams, "Princess,"	Trans. and 3

No. 9. AYRSHIRES (IMPORTED).

Best cow, 3 years old and upwards, S. D. Hungerford, Adams, "Challenge,"	25
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Discretionary.

S. D. Hungerford, Adams, on his cow, "Bessie," Worthy of special commendation. Previously awarded 1st Prize.

No. 5. ALDERNEYS OR JERSEYS.

Best bull, 3 years and upwards, Maurice E. Viele, Albany, "Jersey,"	\$25
Best bull, 2 years old, W. S. Johnson, Poughkeepsie, "Putnam," . . .	20
Best bull calf, Maurice E. Viele, Albany, "J. T. Norton,"	5
Best heifer, 1 year old, Maurice E. Viele, Albany, "Violet,"	15

No. 10. ALDERNEYS OR JERSEYS (IMPORTED).

Best cow, 3 years old and upwards, Maurice E. Viele, Albany, "Marie,"	25
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Discretionary.

C. A. Burt, Albany, for his cow, 2d best,	Vol. Trans.
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No. 11. GRADE CATTLE—COWS.

Best cow, 3 years old and upwards, Mather & Moore, Albany, "Lady Washington,"	\$25
2d best, W. H. Slingerland, Normanskill,	15
3d best, James F. Converse, Woodville, Jefferson county,	5
Best heifer, 2 years old, Henry Corke, Rhinebeck,	20
2d best, H. & F. Bowen, Coon & Tompkins, Medina,	10
3d best, Charles E. Pease, Albany,	5
Best heifer, 1 year old, E. Griffin, Clinton Corners, Dutchess county,	15
2d best, Wood & Eastville, Woodville,	10
3d best, do, do,	5
Best heifer calf, do, do,	5
2d best, L. Woodward, Saratoga Springs,	Trans. and 3

Discretionary.

A. E. Van Allen, East Greenbush, 1 year old heifer, "Betsey," . .	Diploma.
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MILCH COWS OF ANY BREED.

Best milch cow, W. H. Slingerland, Normanskill, Short Horn, "Jenny Lind,"	\$20
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No. 12. WORKING OXEN OVER FIVE YEARS OLD.

Best yoke of oxen, T. Baker, Earlville, Madison county,	20
2d best, Joseph Hilton, New Scotland,	15
3d best, Wm. H. Slingerland, Normanskill,	5

No. 13. OXEN, FOUR YEARS OLD.

Best single yoke, E. Otley, Phelps, Ontario county,	15
2d best, A. Fitch, New Scotland,	10
3d best, Luther Comstock, Kirkland, Oneida county,	4

Discretionary.

James M. Winne, Schodack, Vol. Trans.

No. 14. STEERS, THREE YEARS OLD.

Best single yoke, E. Ottley, Phelps, \$10

2d best, H. & F. Bowen, Coon & Tompkins, Medina, 8

3d best, Isaac Miller, Valley Falls, Trans. and 3

No. 15. STEERS, TWO YEARS OLD.

Best single yoke, Wood & Eastman, Woodville, Jefferson county, ... 8

ONE YEAR OLD.

Best single yoke, Wood & Eastman, Woodville, Jefferson county, red Durham, 6

2d best, P. S. Forbes, Bath, Rensselaer county, Devons, 5

3d best, Wood & Eastman, Woodville, pied Durhams, Trans. and 3

Discretionary.

Andrew Booth, Bethlehem, 12 years old, for training pair small steers, S. M.

No. 16. FAT CATTLE—STALL FED.

Best ox, 4 years and under 5, Thos. Doty, Clinton Corners, Dutchess county, \$12

Best cow, 4 years and upwards, Elon Sheldon, Sennet, Cayuga county, 10

Best heifer, 3 years old, G. H. & A. D. Gazley, Pleasant Plains, 8

Thos. Kimber, of Syracuse, exhibited 2 oxen, one 5 and one 6 years of age. Excluded by the rules of the Society, on account of age. The committee recommended some suitable token of appreciation of their merit.

A. D. & G. H. Gazley exhibited one yoke of fine oxen, excluded for the same reasons above, and the committee made the same recommendations.

No. 17. FAT CATTLE, ON HAY AND GRASS.

Best cow, 4 years and upwards, Geo. H. Charles, Albany, \$10

Best steer, 3 years old, Jas. Wadsworth, Jr., Geneseo, 8

2d best steer, C. Wadsworth, Geneseo, 3

3d best steer, Geo. H. Charles, Albany, Trans.

No. 18. FOREIGN CATTLE.

Best short-horn bull, 2 years and upwards, John Snell, Edmonton, C.

W., "Durham" 3 years old, Dip. and 15

Best cow, do 15

Best Ayreshire bull, H. D. Burgett, West Stockbridge, Mass.,

"Jim," Dip. and 15

Best pair working oxen, out of State, W. R. Duncan, Winchester, Ky. 15

2d best, S. Blakeman, Shaftsbury, Vt., 10

Best fat ox, J. Van Alstyne, Indiana, 10

Best fat steer, W. R. Duncan, Winchester, Ky., 10

Best fat heifer, C. F. Willis, Bourbon county, Ky., 10

CLASS II.—HORSES.

No. 19. FOR ALL WORK—STALLIONS.

Best stallion, 4 years and upwards, George W. Adams, Whitehall,

"America," 25

2d best, Dr. F. Vandenburg, Rhinebeck,.....	\$15
3d best, Thomas North, Middlefield, Otsego county, .	5
4th best, P. W. Deitz, Schoharie, "Duroc,".....	Youatt.
"Teronto Chief," S. R. Bowne, Flushing, entered for exhibition only.	
Highly commended.	

No. 19, A. BROOD MARES AND FOALS.

Best brood mare (with foal at her foot), 4 years and upwards, Ira Blakeman, Greenbush (colt sired by Reindeer),	\$25
2d best, B. B. Kirtland, Greenbush (Black-Hawk colt),.....	15
3d best, M. J. Blessing, Albany (colt sired by Magnum Bonum),....	5
4th best, Chas. A. Mott, Lansingburgh,.....	Youatt.

No. 19, B. HORSES OF MORGAN OR BLACK-HAWK BREED.

Best stallion, 4 years and upwards, Grove Bradley, Meridian, "Napoleon Black-Hawk,"	\$25
2d best, A. W. Swift, New York, "Vergennes,"	15
3d best, Martin Deyo, Claverack, "Young Andrew Jackson,".....	5
Best brood mare (with foal at her foot), 4 years and upwards, R. W. Macy, Chatham Four Corners, Columbia county,.....	25

No. 20. DRAUGHT.

Best stallion, 4 years and upwards, D. Case, Lockport, "Young Norman,"	25
2d best, James Boyle, Albany,	15
3d best, C. Scoby, Springport, "Young Samson,"	5
4th best, S. A. Rogers, Jordan, "Young Samson,".....	Youatt.
Best pair of matched draught or farm horses, J. T. Wisner, Lyons, ..	\$15
2d best, Jurian Winne, Bethlehem,	10

Discretionary.

C. Slingerland, New Scotland, best pair matched farm horses,....	Youatt.
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No. 21. THOROUGH BRED.

Best stallion, 4 years and upwards, J. S. Schermerhorn, Schenectady, "Peer,"	25
Best brood mare (with foal at her foot), 4 years and upwards, P. S. Forbes, Bath, Rensselaer county, "Madonna,"	25
Best stallion, 3 years old, Alex. Bathgate, Morrisania, "Cornet,"...	20

No. 22. THREE YEARS OLD.

Best stallion, 3 years old, G. B. Allen, New Rochelle, "Roebuck,".	20
2d best, E. Gazely, Clinton, Dutchess county, "Black-Hawk Chief,"	10
3d best, Caleb Tompkins, Mamaroneck, "Shoreham,".....	3
4th best, John V. Storm, Stormville, Dutchess county,.....	Dadd.
Best mare, 3 years old, J. Sutton, Warwick, Orange county,.....	\$20

No. 23. TWO YEARS OLD.

Best stallion, 2 years old, H. Ainsworth, Jefferson county,	15
2d best, E. H. Bassett, Chatham Four Corners, Columbia county,...	10
3d best, Charles Duncan, West Troy,.....	Dadd.
Best mare, 2 years old, G. Vandenburg, Troy,.....	15

2d best, James G. Mott, Lansingburgh,.....	\$10
3d best, A. A. Dunlop, West Troy,.....	Dadd.

No. 24. ONE YEAR OLD, COLTS.

Best stallion, 1 year old, Peter Van Wie, Bethlehem,.....	\$10
2d best, F. N. Lawrence, Flushing, "Silas Wright,".....	5
3d best, Alex. Bathgate, Morrisania, "Cernet,".....	Dadd.
Best mare, 1 year old, Joseph Daniels, Bath, Rensselaer county,....	\$10
2d best, James G. Mott, Lansingburgh,.....	5
3d best, M. J. Blessing, Albany,.....	Dadd.

No. 25. MATCHED HORSES—*Not under 16 hands, for road or carriage.*

Best pair of matched horses, 16 hands and over, D. T. Walbridge, Rochester, ..	\$15
2d best, J. L. Treat, Auburn,.....	10

No. 26.—MATCHED HORSES—*For road or carriage.*

Best pair of matched horses, 14 to 16 hands, E. Milbank, Bethlehem,	15
2d best, L. Rosekrans, Clifton Park,	10

No. 28. GELDINGS.

Best gelding, E. Milbank, Bethlehem,.....	10
2d best, H. Beals, Adams, Jefferson county,.....	8

No. 29. SINGLE MARES.

Best, J. R. Hemingway, Canaan, Columbia county,.....	10
2d best, E. G. Buck, Fort Edward, Washington county,.....	8

Discretionary.

Chas. Duncan, West Troy; mare 27 years old; nice for one of her age,.....	Dip.
S. Segue, Albany; very large and fine,.....	Dip.
P. S. Forbes, Bath, Rensselaer county; very fine movement,.....	Dip.

No. 30. THREE YEARS OLD GELDINGS AND MARES.

Best 3 year old gelding, John C. La Grange, Bethlehem,	\$6
Best mare, 3 years old, Seneca Dennis, Schaghticoke, Rensselaer Co.	6

No. 31. SINGLE TROTTING HORSE, MARE, OR GELDING, IN HARNESS.

Best, Chas. Robinson, Fishkill Plains, Dutchess county,.....	\$10
2d best, R. G. Clark, Argyle, Washington county,.....	8
Special premium to boys under 18 years of age (who shall exhibit the best trained colt under his own direction), H. Q. Hawley, Jr., Albany,	5

No. 32. FROM OTHER STATES AND CANADA.

Best blood stallion, 3 years and upwards, Thomas G. Ayerigg, Passaic, N. J., "Gov. Wright,".....	15
Best brood mare, 3 years and upwards, H. L. Shields, Bennington, Vt., "Beloit,".....	15
Best stallion, horse of all work, 3 years and upwards, T. M. Gillespie, Bloomfield, N. J., "Arabian Marmaduke,".....	15
Best brood mare, of all work, 3 years and upwards, T. J. Wallace, Providence, R. I.,.....	15

Best brood mare, 3 years and upwards, A. Jeffrey, Woodbridge, C. W.	\$15
Best matched horses, not under 16 hands, T. G. Ayerigg, Passaic, N. J.	15
Best single mare, horse, or gelding, in harness, C. S. Haines, Elizabeth, N. J.,	10

Discretionary.

H. L. Shields, Bennington, Vt., for all work brood mare,	Dip.
Andrew Holmes, Monkton, Vt., for trotting mare, 8 years old,	Dip.

No. 33. JACKS AND MULES.

Best jack, Chamberlain & Whittlesey, Aurelius. Imported "Fido,"	\$20
Best jennet, W. J. Wheeler, Watervliet. Imported "Eugenia,"	20
Best pair of mules, A. Strain, Albany,	15

CLASS III.—SHEEP.

No. 34. FAT SHEEP.

Best fat sheep, long woolled, 2 years and upwards, G. H. & A. D. Gazley, Pleasant Plains,	5
2d best, Robert Brodie, Smithville, Jefferson county,	3
3d best, Jurian Winne, Albany,	Morrell's Shep.
Best long woolled, under 2 years, James G. Wayne, Bethlehem, Albany county,	\$5
2d best, E. Ottley, Phelps, Ontario county,	3
3d best, do do do	Morrell's Shep.
Best middle woolled, 2 years and upwards, R. C. Derrick, Center Brunswick,	\$5
2d do do	3
Best middle woolled, under 2 years, O. Howland, Auburn,	5
2d best, O. Howland, Auburn,	3
Best cross breed, 2 years and upwards, H. Bowen, Jr., Medina,	5
2d best do	3
3d best, James F. Converse, Woodville, Jefferson county, ..	Morrell's Shep.
Best cross breed, under 2 years, H. Bowen, Jr., Medina,	\$5
2d best, R. C. Derrick, Center Brunswick,	3

No. 35. LONG WOOLED.

Best buck, 2 years and upwards, John Betteridge, Riga, Monroe Co.,	10
2d best, G. H. & A. D. Gazley, Pleasant Plains,	8
3d best, John McDonald, Warren, Herkimer county,	5
Best buck, under 2 years, Jurian Winne, Albany,	10
2d best, G. H. & A. D. Gazley, Pleasant Plains,	8
3d best, James Betteridge, Riga, Monroe county,	5
Best pen 5 ewes, 2 years and upwards, V. H. Hallock, Dover Plains,	10
2d best, G. H. & A. D. Gazley, Pleasant Plains,	8
3d best, John McDonald, Warren,	5
Best pen 5 ewes, under 2 years, G. H. & A. D. Gazley, Pleasant Plains,	10
2d best, John McDonald, Warren,	8
3d best, Wood & Eastman, Woodville, Jefferson county,	5

Best pen 3 buck lambs, G. H. & A. D. Gazley, Pleasant Plains,....	\$5
2d best, John McDonald, Warren,	Merrell's Shep.
Best pen 3 ewe lambs, G. H. & A. D. Gazley, Pleasant Plains,....	5
2d best do do do	Morrell's Shep.

SPECIAL.

E. Ottley, Phelps, for his pen of 5 ewes, the same having been over- looked by the committee, a special premium, equal to the first,....	\$10
No. 36. MIDDLE WOOLED—(<i>South Downs</i>).	

Best buck, 2 years and upwards, Samuel Thorne, Thornedale, Dutchess county,	10
Best buck, under 2 years, do 	10
2d best do do 	8
3d best do do 	5
Best pen 5 ewes, 2 years and upwards, E. Corning, Jr., Albany,....	8
2d best, John H. Booth, Bethlehem,	5
Best pen 3 buck lambs, E. G. Cook, Ellisburgh,.....	Morrell's Shep.
Best pen 3 ewe lambs, John H. Booth, Bethlehem,.....	\$5

SHROPSHIRE DOWNS.

Best buck, 2 years, Jacob Lorillard, New York,.....	10
2d best, C. Parsons, Riga, Monroe county,	5
Best pen 5 ewes, 2 years, Jacob Lorillard, New York,	10
2d best, C. Parsons, Riga,.....	8
2d best 5 ewes, 1 year, do 	8
2d best 3 buck lambs, do 	Morrell's Shep.
2d best 3 ewe lambs, do 	do

No. 37. SPANISH MERINOES.

Best buck, 2 years and upwards, J. Stickney, Wheeler, Steuben Co.,	\$10
2d best, Potter Baker, Hoosick, Rensselaer county,.....	8
3d best, Wm. H. Armstrong, Hoosick,.....	5
Best buck, under 2 years, J. Stickney, Wheeler, Steuben county,...	10
2d best, Potter Baker, Hoosick, Rensselaer county,.....	8
3d best, John M. Percy, do do 	5
Best pen 5 ewes, 2 years and upwards, George Brown, Oaks Corners, Ontario county,.....	10
2d best, N. P. Brown, Hoosick,	8
3d best, J. Stickney, Wheeler,	5
Best pen 5 ewes, under 2 years, Potter Baker, Hoosick,.....	10
2d best, Geo. Brown, Oaks Corners,.....	8
3d best, John M. Percy, Hoosick,.....	5
Best pen 3 buck lambs, J. Stickney, Wheeler,.....	5
2d best, Geo. Brown, Oaks Corners,....	Morrell's Shep.
Best pen 3 ewe lambs, do 	\$5
2d best, Wm. M. Holmes, Greenwich, Washington county, Morrell's Shep.	
Best samples of wool, not less than 5 fleeces, George Brown, Oaks Corners,	S. M.
2d best, Wm. M. Holmes, Greenwich,.....	V. T.

No. 38. SILESIAN MERINOES.

Best buck, 2 years and upwards, William Chamberlain, Red Hook, Dutchess county,.....	\$10
2d best do	8
3d best, C. W. Hull, New Lebanon,.....	5
Best buck, under 2 years, Wm. Chamberlain, Red Hook,.....	10
2d best, Geo. Brown, Oaks Corners,.....	8
3d best, Wm. Chamberlain, Red Hook,	5
Best pen 5 ewes, 2 years and upward, do	10
Best pen 5 ewes, under 2 years, do	10
2d best, Geo. Brown, Oaks Corners,.....	8
3d best, Wm. Chamberlain, Red Hook,.....	5
Best pen 3 buck lambs, do	5
Best pen 3 ewe lambs, do	5
Best sample of wool, Geo. Brown, Oaks Corners,.....	S. M.

No. 39. FRENCH MERINOES.

O. Howland, Auburn, 3 entries and no competition; the committee award him	\$5
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No. 40. SAXONS.

Best buck, 2 years and upwards, T. V. Maxon, Adams, Jefferson Co.	10
2d best, Geo. Dakin, North East, Dutchess county,.....	8
3d best, C. W. Hull, New Lebanon,.....	5
Best buck, under 2 years, do	10
2d best, T. V. Maxon, Adams, Jefferson county,.....	8
3d best, Geo. Dakin, North East,	5
Best pen 5 ewes, 2 years and upwards, C. W. Hull, New Lebanon,...	10
2d best, Geo. Dakin, North East,.....	8
3d best, C. W. Hull, New Lebanon,.....	5
Best pen 5 ewes, under 2 years, do	10
2d best, Geo. Dakin, North East,.....	8
3d best, C. W. Hull, New Lebanon,.....	5
Best pen 3 buck lambs, Geo. Dakin, North East,.....	5
Best pen 3 ewe lambs, do	5
2d best do do	Morrell's Shep.

No. 41. CROSS BREED, OF FINE WOOL—SAXONS AND MERINOES.

Best buck, 2 years and upwards, E. G. Cook, Ellisburgh, Jefferson county,.....	\$10
2d best, D. W. Curtis, Canaan, Columbia county,	8
3d best, O. Howland, Auburn,	5
Best buck, under 2 years, do	10
Best pen 5 ewes, 2 years and upwards, Wm. Chamberlain, Red Hook,	10
2d best, D. W. Curtis, Canaan,.....	8
3d best, O. Howland, Auburn,	5
Best pen 5 ewes, under two years, E. G. Cook, Ellisburgh,	10
Best pen 3 buck lambs, Geo. Brown, Oaks Corners,.....	5

2d best, Wm. Chamberlain, Red Hook,	Morrell's Shep.
Best pen 3 ewe lambs, W. M. Holmes, Greenwich,	\$5
2d best, C. W. Hull, New Lebanon,	Morrell's Shep.
Best samples of wool, not less than 5 fleeces, Wm. M. Holmes, Greenwich, Washington county,	Silver medal.

No. 42. CROSS BREED, OF COARSE OR MIDDLE WOOL.

Best buck, 2 years and upwards, John McDonald, Warren,	\$10
2d best, Zerah Rider, Jr., Coila, Washington county,	8
3d best, Sam'l A. Curtis, Canaan,	5
Best buck, under 2 years, H. Bowen, Jr., Medina,	10
2d best, Robert Brodie, Smithville, Jefferson county,	8
Best pen 5 ewes, 2 years and upwards, H. Bowen, Jr., Medina,	10
2d best, Jno. McDonald, Warren,	8
3d best, Zerah Rider, Jr., Coila,	5
Best pen 5 ewes, under 2 years, H. Bowen, Jr., Medina,	10
2d best, John McDonald, Warren,	8
3d best, Sam'l A. Curtis, Canaan,	5
Best pen 3 buck lambs, Austin Eastman, Bellville, Jefferson county,	5
2d best, Rob't Brodie, Smithville,	Morrell's Shep.
Best pen 3 ewe lambs, John McDonald, Warren,	5
2d best, H. Bowen, Jr., Medina,	Morrell's Shep.
Best shepherd's dog, Jacob Lorrillard, New York city,	\$5

No. 43. FROM OUT OF THE STATE.

Long wooled, best buck, John Snell, Brampton, C. W.,	10
Best pen 5 ewes, G. C. Hitchcock, "Ash Grove," near Preston, Conn.	10
Middle wooled, best buck, J. C. Taylor, Holmdel, N. J.,	10
do best 5 ewes, John R. Sickles, Marlboro, N. J.,	10

No. 44. FROM OUT OF THE STATE.

Merinoes, best buck, Jesse Hinds, Brandon, Vt.,	10
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No. 45. SWINE—LARGE BREED.

Best boar, 2 years old and upwards, E. Wait, Walden, Orange county,	10
2d best, S. D. Hungerford, Adams,	5
Best boar, 1 year old, E. Griffin, Clinton Corners, Dutchess county,	10
2d best, Wm. Richardson, Albany,	5
Best boar, 6 months and under 1 year, Clark & Gillett, Smithville,	8
Best breeding sow, 2 years old and upwards, S. D. Hungerford, Adams,	10
2d best, 2 years old and upwards, Wm. Richardson, Albany,	5
Best breeding sow, 1 year old, A. M. Underhill, Clinton Corners, Dutchess county,	10
Best sow, 6 months and under 1 year, Converse & Brodie, Woodville,	8
Best lot of pigs, not less than 5, under 10 months, Jas. F. Converse, Woodville, Jefferson county,	8
2d best, Converse & Brodie, not less than 5, under 10 months, Woodville, Jefferson county,	4

SMALL BREED.

Best boar, 2 years old and upwards, A. M. Underhill, Clinton Corners,	\$10
Best boar, 1 year old, John H. Booth, Bethlehem,.....	10
2d best, James L. Mitchell, Albany,	5
Best boar, 6 months and under 1 year, Sam'l Thorne, Thornedale,..	8
2d best, 6 months and under 1 year, Wood & Eastman, Woodville,..	4
Best breeding sow, 2 years old and upwards, E. Corning, Jr., Albany,	10
2d best, 2 years old and upwards, James L. Mitchell, Albany,.....	5
Best breeding sow, 1 year old, C. Rapp, Jr., Albany,	10
Best sow, 6 months and under 1 year, Wood & Eastman, Woodville,	8
2d best, 6 months and under 1 year, Samuel Thorne, Thornedale,....	4

No. 46. POULTRY (DOMESTIC AND FROM OTHER STATES).

Best lot of white Dorkings, not less than 3 (1 cock and 2 hens), J. H. Clapham, Albany,.....	3
2d best, not less than 3 (1 cock and 2 hens), Nathaniel Barnes, Kirkland,	2
Best gray or speckled do, Nathaniel Barnes, Kirkland,...	3
2d best, D. S. Heffron, Utica,.....	2
Best lot black Spanish, J. R. Harcourt, Bethlehem,	3
2d best, J. H. Clapham, Albany,.....	2
Best lot white Polands, J. H. Clapham, Albany,	3
2d best, E. A. Wendell, Albany,	2
Best lot black Polands, J. H. Clapham, Albany,	3
2d best, Nathaniel Barnes, Kirkland,.....	2
Best lot golden Polands, J. H. Clapham, Albany,	3
2d best, J. R. Harcourt, Bethlehem,	2
Best lot silver Polands, J. R. Harcourt, Bethlehem, ...	3
2d best, J. H. Clapham, Albany,	2
Best lot of Bolton grays, J. H. Clapham, Albany,.....	3
2d best, Nathaniel Barnes, Kirkland,.....	2
Best lot game (Earl Derby), D. S. Heffron, Utica,.....	3
2d best, Nathaniel Barnes, Kirkland,.....	2
Best lot game English pheasant, J. H. Clapham, Albany,.....	3
2d best, J. H. Clapham, Albany,.....	2
Best lot game Sumatra, J. H. Clapham, Albany,	3
Best lot game Mexican, J. H. Clapham, Albany,	3
2d best, E. A. Wendell, Albany,	2
Best lot game Irish, E. A. Wendell, Albany,.....	3
2d best, J. H. Clapham, Albany,	2
Best lot game Chinese, E. A. Wendell, Albany,.....	3
2d best, E. A. Wendell, Albany,	2
Best lot of buff or red Shanghai, N. Barnes, Kirkland,.....	3
2d best, J. H. Clapham, Albany,	2
Best lot of white Shanghai, J. H. Clapham, Albany,.....	3
2d best, E. A. Wendell, Albany,.....	2
Best lot of gray Shanghai, John Dack, Woodville,.....	3

2d best, E. A. Wendell, Albany,	\$2
Best lot Leghorn fowls, C. Many, Albany,	3
2d best, C. Many, Albany,	2
Best lot gold lace bantams, J. H. Clapham, Albany,	3
2d best, J. R. Harcourt, Bethlehem,	2
Best lot silver lace bantams, J. H. Clapham, Albany,	3
Best lot Java, J. R. Harcourt, Bethlehem,	3
2d best, J. H. Clapham, Albany,	2
Best lot African, D. S. Heffron, Utica,	3
2d best, J. R. Harcourt, Bethlehem,	2
Best lot of any other variety, J. H. Clapham, Albany,	3
2d best, J. R. Harcourt, Bethlehem,	2

TURKIES.

Best pair turkies, Ralph H. Avery, Wampsville,	3
2d best, Nathaniel Barnes, Kirkland,	2

DUCKS.

Best pair Muscovy, E. A. Wendell, Albany,	\$3
2d best, J. Rosekrans, Clifton Park,	2
Best pair Aylesbury, D. S. Heffron, Utica,	3
2d best, Nathaniel Barnes, Kirkland,	
Best pair black Cayugas, J. R. Page, Sennett,	3
2d best, E. A. Wendell, Albany,	2
Best pair topknots, Nathaniel Barnes, Kirkland,	3
2d best, E. A. Wendell, Albany,	2
Best pair common, J. R. Harcourt, Bethlehem,	3
2d best, E. A. Wendell, Albany,	2

GEESE.

Best pair common, J. H. Clapham, Albany,	\$3
2d best, E. A. Wendell, Albany,	2
Best pair Bremen, Peter Van Wie, Bethlehem,	3
2d best, J. Rosekrans, Clifton Park,	2
Best pair African, Nathaniel Barnes, Kirkland,	3
2d best, J. H. Clapham, Albany,	2

GUINEA FOWLS.

Best lot, J. H. Clapham, Albany,	\$3
2d best, Nathaniel Barnes, Kirkland,	2

PEA FOWLS.

2d best, J. Rosekrans, Clifton Park,	\$2
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PIGEONS.

Best and greatest variety, E. A. Wendell, Albany,	\$3
2d best, D. J. Tyler, Albany,	2

BEST EXHIBITION OF POULTRY OWNED BY EXHIBITORS.

Best lot, J. H. Clapham, Albany,	\$5
2d best lot, E. A. Wendell, Albany,	3

RABBITS.

Best pair long eared, J. H. Clapham, Albany,	\$3
2d best, Wm. Richardson, Albany,	2
Best pair common, J. H. Clapham, Albany,	3
2d best, J. V. Wendell, Albany,	2

Discretionary.

Master Arch'd McIntyre, Albany, for coop of superior spring chicken-turkies, specially commended as finely bred and beautiful plumage, Dip.

CLASS IV.

No. 47.—PLOWING MATCH.

1st premium, P. Slocum, Jr., Warsaw, Wyoming Co.,	\$20
2d do John Randerson, Schodack Landing,	15
3d do Rulofson & Harvey, Penn Yann,	10
4th do A. R. McCormick, Bethlehem,	5
5th do O. Howland, Auburn,	Trans.

BOYS UNDER 18 YEARS OF AGE.

1st premium, Nelson Best, Normanskill,	\$20
2d do S. D. French, Warren, Herkimer Co.,	15
3d do H. W. Clum, Claverack,	10
4th do John H. Slingerland, Bethlehem,	5

No. 49. FARM IMPLEMENTS—No. 1.

Best farm wagon, John E. Morgan, Deerfield, Oneida County,	\$5
2d best do W. P. Ottley, Phelps,	3
Best combined harrow and cultivator, Pease & Eggleston, Albany, ...	5
2d best harrow, S. S. Parker, Lockport,	3
Best two horse cultivator, Sayre & Remington, Ilion,	5
Best one horse cultivator, Pease & Eggleston, Albany,	5
2d best do do Sayre and Remington, Ilion,	3
Best Fanning Mill, Wm. Lawyer, Schoharie C. H.,	5
2d best do I. T. Grant & Co., Junction, Rens. Co.,	3
Best corn stalk and hay cutter, Emery Bros., Albany,	5
2d best do do J. H. Mumma, Harrisburgh, Pa., ...	3
Best corn and cob crusher, by horse power, D. Corkins, agent, Troy, ..	5
2d best do do Pease & Eggleston, Albany,	3
Best clover mill and cleaner, Birdsall & Brokard, West Henrietta, ..	5
2d best do Emery Bros., Albany,	3
Best clover gatherer, James A. Disbrow, Poughkeepsie,	5
Best horse hay rake, J. C. Burgett, Davenport, Delaware county, ...	4
2d best do Elbert White, Stamford, Ct., (metallic spring tooth,)	2
Best ox yoke, Pease & Eggleston, Albany,	2
2d best do Emery Bros., Albany,	1
Best roller, for general use, Pease & Eggleston, Albany,	5
Best clod crusher and roller combined, Herald & Tompkins, Trumansburgh,	5

2d best clod crusher and roller combined Anson Thompson, South Glens Falls,	\$3
Best hay, straw or corn stalk cutter, on a new and improved principle, Dow & Fowler, Fowlerville, Liv. county,	Silver Medal.

Discretionary.

Emery Bros., Albany, wagon jacks, apple parers, and India rubber belting,	Dip.
J. Clarke, Unadilla Forks, horse hay rake,	Dip.
A. Y. Adams, Troy, improved carriage jack,	Dip.
John E. Morgan, Deerfield, double or single farm wagon,	Dip.
A. J. Robinson, Gypsum, Ontario county, revolving dirt scraper, ...	Dip.

SPECIAL.

H. Rexford, Rexford Flats, market wagon, remarkably well made, Dip.	
Shaible & Bidwell, Schenectady, two farm wagons, ... Highly commended.	
Duryea & Glasse, Haverstraw, single wagon,	Dip.
T. H. Wilson, Harrisburgh, Pa., hay, straw, and stalk cutter, of great merit,	Dip.

No. 50. FARM IMPLEMENTS—No. 2.

Best wagon harness, for farm, L. J. Lloyd, Albany,	\$5
Best carriage harness, do do	5
Best single harness, do do	5
Best gent.'s riding saddle, do do	5
Best ladies' riding saddle, do do	5
Best churn; Vail & Hammond, "Air pressure," N. Y. city,	3
2d best, George Green, Galesburgh, Ill.	2
Best cheese press, Charles Taylor, Little Falls,	3
2d best, do George R. Comstock, Little Falls,	2
Best grain cradle, I. T. Grant & Co., Junction,	3
2d best do W. W. Bryan, Mechanicville,	2
Best 12 hand rakes, Pease & Eggleston, Albany,	3
2d best, do Emery Bros., do	2
Best 6 hay forks, do do	3
2d best, do Pease & Eggleston, do	2
Best 6 grass scythes, Emery Bros., do	3
2d best do Pease & Eggleston do	2
Best 6 cradle scythes, do do	3
2d best do Emery Bros., do	2
Best scythe snath and scythe, Pease & Eggleston, Albany,	3
2d best do do Emery Bros., Albany,	2
Best 6 manure forks, Emery Bros., Albany,	3
2d best do Pease & Eggleston, Albany,	2
Best 6 hand hoes, assorted, do do	3
2d best do do Emery Bros., do	2
Best potato digger, J. B. Parvin, Hightstown, N. J.,	3
2d best do Robert Niven, Rochester,	2

Best arrangement for unloading hay, by horse or steam power, C. E.

Gladding, Troy, Penn.,.....	\$3
2d best do Herald & Tompkins, Trumansburgh,.....	2

Discretionary.

A. B. Pratt, Albany, barley forks,.....	Dip.
Emery Bros., do potato diggers,.....	Fitch.
Pease & Eggleston Albany, do	do
Emery Bros., Albany, spades and shovels,.....	V. T.
Pease & Eggleston, Albany, do	do
Emery Bros., Albany, mattocks and bog hoes,.....	Youatt.
T. J. Fredericks, Rockland county, trotting harness,.....	Dip.
W. S. Johnson, Haverstraw, farm and single harness,.....	Dip.

NO. 51. FARM IMPLEMENTS—NO. 3.

Best portable saw mill, for wood fences and farm use, Pease & Eggleston, Albany,.....	\$8
2d best do Wheeler, Melick & Co.,.....	6
Best corn sheller, horse power, Pease & Eggleston, Albany,.....	{ 4
Best do do Emery Bros., (joint award,) Albany,.....	
2d best do do T. H. Wilson, Harrisburgh, Pa.,.....	6
Best corn sheller, hand power, P. P. Taft, Taftville, Vt.,.....	6
2d best do do Pease & Eggleston, Albany,.....	4
Best vegetable cutter, Pease & Eggleston, Albany,	{ 3
Best do Emery Bros., Albany, joint award,	
Best portable grist mill, Taylor & Shinn, Philadelphia, Penn.,.....	8
2d best do do J. C. Lyons, Auburn,.....	6
Best farm or road scraper, Emery Bros., Albany,.....	5
2d best do do Pease and Eggleston, Albany,.....	3
Best horse power churning machine, Damon, Speakman & Co., Westchester, Pa.,	5
Best dog power churning machine, Emery Bros., Albany,.....	5
Best pump for farm use, L. P. Dodge, Newburgh,.....	5
Best arrangement for raising water other than pump, Emery Bros., Albany,	5
Best horse hoe for cleaning drilled grain crops, Milton Alden, Auburn,	8
Best horse power (lever principle), Dow & Fowler, Fowlerville,.....	8
2d best do do G. Westinghouse, Schenectady, ..	4
Best horse power endless railway, Wheeler, Melick & Co., and Emery Bros., (joint award,) Albany,	{ 4
Best thrasher, with cleaner and separator, Dow & Fowler, Fowlerville,	
2d best do do do Watertown Agric'l Works, Watertown,	3
Best and most numerous collection of agricultural implements, Emery Bros., Albany,.....	20
Best and most numerous collection of agricultural and gardening tools and implements, manufactured in the State of New York, by or under the supervision of the exhibitor, materials, workmanship,	

utility, durability, and prices to be considered in both cases, Charles
E. Pease, Albany,..... \$20

Discretionary.

Jeremiah Darling, Cincinnati, O., rotary horse power, and saw mill, .. Dip.
Wheeler, Melick & Co., Albany, combined thrasher and winnower, .. Dip.
do do thrasher and separator,..... Dip.
Pease & Eggleston, Albany, endless chain railway horse power, Dip.
C. D. V. Ham & Co., Nassau, endless chain horse power, Dip.
Ridgeway & Co., Albany, house pumps,..... Dip.
Sayre & Remington, Ilion, horse hoe,..... Dip.
G. W. Fairman, Albany, Burr stone grist mill, (Harrison's patent,) .. Dip.
Harvey & Son, Amsterdam, thrasher and cleaner, Dip.
R. & M. Harder, Cobleskill, Schoharie co., thrasher and separator,
(endless chain horse power,)..... Dip.
G. Westinghouse, Schenectady, thrasher and winnower, Dip.
A. Thayer, Malden Bridge, "Columbian" Pumps,..... Dip.
Emery Bros., Albany, 2 horse power thrasher and cleaner,..... Dip.
Starbuck Bros., Troy, smut machine (best), Dip.
B. F. Trimmer, Rochester, grain separator, Dip.
T. H. Wilson, Harrisburgh, Pa., combined cider mill and corn shel-
ler, Dip.

No. 52. MACHINERY.

Best grain drill, with apparatus for distributing grain, seed and ma-
nures, John C. Stevens, Lee, Mass., Sil. Med.
Best improved tile or other invention for securing the run of water in
drains, F. M. Mattice, Buffalo,..... \$5
Best set draining tools, F. M. Mattice, Buffalo, 5
Best assortment of carpenters' tools, Richard Carter, Troy, 5
Best chime of bells, Jones & Co., Troy, Dip. and S. M.
Best church bell, Jones & Co., Troy,..... Dip.
Best steamboat bell, A. Meneeley & Sons, West Troy, Dip.
Best locomotive bell, Jones & Co., Troy,..... Dip.
Best improved drain tile and pipe machine, F. Mattice, Buffalo, .. S. Med.
Best hydraulic ram, Pease & Eggleston, Albany,..... S. Med.
Best farm fence, of wood, P. S. Carhart, Collamer, Onondaga
county, \$3 and S. M.
Best Bank lock, Winne & Abeel, Albany, (Lillie's patent,) Dip.
Best ornamented cast iron vase; best ornamented zinc statuary; best
iron chair; best marbleized iron; best fruit and flower stand,
Winne & Abeel, Albany,..... Dip. and S. M.
Best portable machine for watering gardens, Pease & Eggleston,
Albany, Dip.
Best exhibition of saws, Pruyn & Lansing, Albany,..... Dip. and S. M.

Discretionary.

Allen Sherwood, Auburn, combined reaper and binder, Diploma.
Allen Sherwood, grain binder,..... S. Medal.

C. F. Anderson, Northfield, Mass., corn planter of superior merit,...	Dip.
Pease & Eggleston, Albany, corn planter, and Albany seed planter,...	Dip.
D. R. Prindle, East Bethany, corn planter, 2 horse power,	Dip.
L. S. Robinson, Gypsum, portable fence and farm gate,.....	Dip.
E. A. Cleveland, Naples, Ontario county, farm gate,.....	Dip.
A. Meneely's Sons, West Troy, best alarm bell,.....	Dip.
Best factory bell,.....	S. S. M.
M. R. Pierce, New York, hydraulic filter tubing, house and cellar tubing,	Dip.
G. A. Prescott, Sandy Hill, machine for gumming and punching saws,...	Dip.
Emery Brothers, Albany, cotton gin for horse power,	Dip.
Do., horse power governor,.....	S. S. M.
S. C. Ellis, Albany, blind slat tennoning machine,.....	Dip.
Do., blind slat stapling machine,.....	S. S. M.
Jones & Co., Troy, patent rotary yoke for bells (Hildreth's patent),...	S. M.
Academy bell,.....	Dip.
Whitman & Miles, West Fitchburgh, Mass., planing machine knives,...	Dip.
Cowing & Co., Seneca Falls, hydraulic water ram,.....	S. M.
A. Meneely's Sons, West Troy, church bells (2d best),.....	V. T.

NO. 52 A. MACHINERY AND IMPLEMENTS FOR TRIAL, &C.

Best plow with newly invented principles, Rulefson & Harvey, Penn Yan,.....	S. M.
Best cast steel plow, J. & G. Lord & Co., Watertown,	S. M.
Best hay and cattle weighing scales, Sampson, Tibbitts & Co., Troy,...	S. M.
Best moveable steam engine, for farm purposes, G. W. Fairman, Albany,	S. M.
Best Dynanometer, Thomas Potter, agent, Glens Falls, for Neers' patent rotary register and power,	S. M.
Best machine for extracting stumps, T. B. Ginn, agent, Bethlehem, for Hall's stump puller,.....	S. M.
Best hay press, Levi Dedrick, Albany,.....	S. M.
Best gas apparatus, James Condon, Albany, (M. P. Coon's patent,)...	S. M.
For drain tile laid on fair grounds, M. R. Pierce, N. Y. city,	S. M.

Discretionary.

Daniel Doncaster, Albany, Wood planing machine,.....	Dip.
Peter Cook, Tonawanda, Cook's patent lumber, veneer and cutting machine,.....	Dip.
Blymyer, Day & Co., Mansfield, O., Cook's portable sugar evapo- rator,	S. S. M.
S. C. Salisbury, New York, building and architectural former,	Dip.
J. Pine, Troy, rope machine,.....	Dip.
J. E. Phelps, Meridian, Cayuga county, Livingston county improved plow,.....	Dip.
Wm. M. Cassidy, Albany, Huntton's patent carving machine,.....	S. M.
W. P. Jones, Troy, specimen of white metal for all kinds of machi- nery, hardened by steel,.....	S. M.

C. A. Durgin, New York, portable gas apparatus,	Dip.
J. Matteson, Oswego, model of flour packer,	Dip.
Pruyn & Lansing, Albany, steam and water gauges,	V. T.
Do., engine lathe,	Dip.
Do., metallic Venetian blinds,	S. S. M.
O. W. Seeley, Albany, machine for making brick from any clay,	Dip.
E. Waters, Troy, dovetailing and mortising machine,	Dip.
F. Danforth, Auburn, drain tile,	Dip.
D. R. Prindle, Bethany, agricultural cauldron and steam boiler,	S. M.
Collins and Wildman, Troy, turbine water wheel,	Dip.
M. P. Coon, Brooklyn, planing mill, surfaces, (new principle,)	V. T.
Sweet Brothers, Syracuse, scroll saw,	Dip.
Benner & Garrison, Binghamton, hub rimmer,	Dip.
J. A. Taplin, Carthage Landing, portable saw mill,	Dip.
Peter Philips, Ghent, Columbia county, improved capstan for hay press,	S. M.
John D. Chism, Albany, shingle machine,	S. S. M.
John & F. E. Howe, Brandon, Vt., and New York city, counter scales and post office balance,	Dip.
Palmer, Newton & Co., Albany, variety of fire bricks,	Dip. and V. T.

SPECIAL.

D. A. Woodbury, Rochester, stationary steam engine,	S. M.
J. M. Clute, Schenectady, 2 caloric engines, "Ericson's,"	S. M.
Wood & Hurlburt, Utica, 2 portable steam engines, excellent for light power,	S. M.

A special committee, of which Ira Jagger was chairman, reported favorably of Wood & Hurlburt's portable farm engines, on exhibition at the late Fair—as performing well, with excellent furnace arrangements, rendering them, as respects danger from fire, and in all respects, good safe engines for light purposes: a Silver Medal awarded.

Ericson's caloric engines, of one and two horse power, exhibited by the Messrs. Clutes of Schenectady, of which over two hundred have been put in operation the past year, which augurs well for the success of the machines: a Silver Medal awarded.

The attention of the Executive Committee having been called to an award made at the Fair, by Committee 52 A, for the most valuable machine or implement for farmers, to D. M. Osborn & Co., for Kirby's combined reaper and mower—on examination, it appeared that this reaper and mower was entered under Committee No. 52, who alone were authorized to pass upon said machine—and as Committee No. 52 A only embraced such articles as were not included in No. 52, the same did not properly come before said Committee.

CLASS V.

No. 53. GRAIN AND SEEDS.

Best sample white winter wheat, not less than 1 bbl., grown present year, E. S. Hayward, Rochester,	\$5
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2d best, sample white winter wheat, not less than 1 bbl., grown present year, D. B. Sweet, Phelps,.....	\$3
Best sample red winter wheat, 1 bbl., O. Howland, Auburn,.....	5
2d best, do do James Sweeney, Phelps,....	3
Best sample white spring wheat, 1 bbl., Maurice E. Viele, Albany,..	5
Best sample red spring wheat, 1 bbl., C. W. Ells, Westmoreland, ...	5
2d best, do do O. Howland, Auburn,.....	3
2d best sample of rye, 1 bbl., E. S. Hayward, Rochester,.....	3
Best sample oats, 1 bbl., H. Weir, Johnsonville,	5
2d best, do do C. W. Ells, Westmoreland,.....	3
Best sample of winter barley, 1 bbl., Norman Gowdy, Lowville, . .	5
2d best, do do W. P. Ottley, Phelps,.....	3
Best sample of buckwheat, 1 bushel, L. L. French, Richfield Springs, 3	
2d best, do do C. W. Hull, New Lebanon,....	2
Best sample of millet, $\frac{1}{2}$ bushel, H. Weir, Johnsonville,	3
Best sample timothy seed, 1 bushel raised present year, H. Morrison, Montgomery, Orange county,.....	3
Best 12 ears yellow seed corn, H. Morrison, Montgomery, Orange county,	3
2d best 12 ears yellow seed corn, W. H. Clum, Claverack,	2
Best 12 ears white seed corn, Daniel Conger, Wolcott,	3
2d best, do L. S. Robinson, Gypsum,.....	2
Best 12 ears sweet corn, A. Ransom, Ireland's Corners,.....	3
2d best, do Philip Myers, Bethlehem,	2
Best sample of peas, 1 bbl., A. B. Mack, Westport, Essex county,...	5
2d best, do do Norman Gowdy, Lowville,.....	3
Best sample of flax seed, 1 bushel, H. Weir, Johnsonville,.....	3
2d best, do do Wm. Newcomb, Pittstown,	2
Best sample of hops, not less than 25 lbs., A. G. Dart, Hubbard's Corners, Madison county,.....	5

Discretionary.

Wm. Thorburn, Albany, 81 varieties of peas, beans and garden seeds, .Dip.	
A. E. Van Allen, East Greenbush, 1 bushel spring wheat, very fine, .Dip.	
W. J. Young, Oyster Bay. Queens county, 12 ears Guinea corn, very fine,	Dip.
Vail & Wait, Vail's Mills, 1 sack buckwheat flour,.....	Dip.

No. 54. VEGETABLES.

Twelve best stalks of celery, D. C. De Forest, De Freestville,.....	\$3
2d do S. V. Thornton, Watervliet,.....	2
Six best heads of cauliflower, John Dingwall, Albany,.....	3
2d do Charles Spratt, Utica,	2
Six best heads of brocoli, do	3
Twelve best white table turnips, H. N. Kimball, Rutland,	3
2d do James L. Mitchell, Albany,.....	2
Twelve best carrots, Maurice E. Viele, Albany,	3
2d do A. Passenger, Albany,	2

Twelve best beets, Maurice E. Viele, Albany,.....	\$3
2d do Z. M. Sanders, Bethlehem,.....	2
Twelve best parsnips, Maurice E. Viele, Albany,	3
2d do A. Passenger, Albany,.....	2
Twelve best onions, do	3
2d do S. V. Thornton, Watervliet,	2
Six best heads cabbage, James L. Mitchell, Albany,	3
2d do W. H. Haswell, West Troy,.....	2
Best twelve tomatoes, Daniel Conger, Wolcott,.....	3
2d do Philip Myers, Bethlehem,.....	2
Two best purple egg plants, W. C. Durant, Albany,.....	3
2d do David McLeod, Albany,	2
Twelve best sweet potatoes, C. L. Twing, Lansingburg,.....	3
2d do Charles E. Pease, Albany,.....	2
Best half peck Lima beans, M. E. Veile, Albany,	3
Best half peck Windsor beans, Mrs. J. T. Van Namee, Pittstown,...	3
Best three heads lettuce, A. Passenger, Albany,.....	3
2d do H. Bailey, Bethlehem,.....	2
Best 12 summer radishes, Charles F. Wait, West Sand Lake,.....	3
Best 12 winter radishes, Francis Russo, New Scotland,.....	3
2d do A. Passenger, Albany,	2
Best Brocoli or German greens, John Dingwall, Albany,	3
2d do M. E. Viele, Albany,.....	2
Best bunch double parsley, Z. M. Sanders, Bethlehem,	2
2d best do James L. Mitchell, Albany,.....	2
Three best garden squashes, M. E. Viele, Albany,.....	3
2d best do Charles E. Pease, Albany,.....	2
Three best large squashes, Francis Russo, New Scotland,.....	3
2d best do W. C. Durant, Albany,	2
Best field pumpkin, H. D. Hawkins, Albany,	3
2d best do Abner Bristol, Adams Center,.....	2
Best half peck of table potatoes, Peter Oliver, New Scotland,.....	3
2d best do do John Sill, Albany,.....	2
Best and greatest variety of vegetables, presented in best condition, raised by exhibitor, David McLeod, Albany,.....	10
2d best do do A. Ransom, Ireland's Corners,	5
Best new and valuable variety of vegetable, with evidence of its supe- riority, "3 var. peppers," S. V. Thornton, Watervliet,.....	3

Discretionary.

M. E. Viele, Albany, cherry peppers,.....	Kitch. Garden.
J. G. Sickles, Stuyvesant, Chinese potatoes,.....	V. T
D. C. De Forest, De Freestville, large product of squash from vine, S. S. M	
W. R. Dornon, Albany, vegetable eggs,.....	S. S. M
Sam'l Cheever, Waterford, 20 varieties potatoes,	S. S. M
S. M. Parke, Albany, cauliflower,.....	V. T
R. T. L. Crofts, Bethlehem, strawberry potatoes,.....	V. T

Liberty Gilbert, Troy, 50 varieties seedling potatoes,.....	S. S. M.
John G. White, Albany, beautiful and excellent variety of tomatoes,	S. S. M.
Mrs. Jane Bates, Watervliet, pickles, very fine,.....	Dip.

No. 55. FLOUR.

Best barrel flour, M. Van Dusen, agent Wellington Manufacturing Co., Albany,.....	S. M.
Best sample starch, from corn, Glen Cove Starch Manufacturing Co., Glen Cove, L. I.,	S. S. M.
Best sample mazena, from corn, do do	S. S. M.
Best samples domestic wheat bread, Mrs. John Quinn, Troy, ...	S. S. M.
Best sample of preserved fresh fruits, with a description of the process used in their preparation, D. Conger, Wolecott,.....	S. S. M.
Best sample of dried apples, not less than half a bushel, Ai Pine, Pittstown, Rensselaer county,.....	S. S. M.
Best sample of dried pears, not less than half a bushel, Ai Pine, Pittstown, Rensselaer county,.....	S. S. M.

Discretionary.

A. E. Jackson, Albany, ornamental and fancy cake,	Dip.
Mrs. R. H. L. Wendell, Albany, pies and cake,.....	S. S. M.
Thomas Fazerkley, Albany, wine biscuit ("Jefferson" and "Washington"),.....	Dip.

No. 56. BUTTER.

Best lot (quality as well as quantity considered) made from 5 cows, in 30 consecutive days, 25 lbs. of the butter exhibited, Jurian Winne, Albany, .	\$20
2d best do do D. T. Weed, Newburgh,.....	15
Best 25 lbs. of butter, made in June, Geo. Webb, Watertown,	15
2d best do do Amos Goulding, Le Ray, Jefferson county,	10
3d best do do N. S. Coe, West Turin,.....	3
4th best do do Ira Brown, Rutland,.....	Trans.
Best 50 lbs. made at any time, Geo. Webb, Watertown,	15
2d best do do Amasa Bailey, Nassau,	10
3d best do do D. T. Weed, Newburgh,.....	5
4th best do do N. S. Coe, West Turin,.....	Trans.

GIRLS UNDER 21 YEARS OF AGE.

Best lot of butter, not less than 10 lbs., made at any time, Lydia S. Gurney, Harpersfield, Delaware county,	Silver cup.
2d best do do Miss Gowdy, Lowville,....	Pair butter knives.
3d best do do Miss Eliza Bannister, Phelps, ..	Set tea spoons.
4th best do do Miss Mary E. French, Richfield Spa, ..	S. S. M.

Discretionary.

W. H. Clum, Claverack, jar butter under 50 lbs., very fine,....	\$5
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No. 57. CHEESE.

One year old and over.

Best 100 lbs.,	Clift Eames, Rutland, Jefferson county,	\$20
2d best do	A. L. Fish, Cedarville, Herkimer county,	15
3d best do	C. W. Ellis, Westmoreland,	10

Less than one year old.

Best 100 lbs.,	Norman Gowdy, Lowville,	20
2d best do	Elisha Peck, Fabius,	15
3d best do	Samuel Mills, Lowville,	10
4th best do	A. B. Mack, Westport, Essex county,	5
5th best do	Reuben Elwood, Fort Plain,	Trans.

No. 58. SUGAR AND HONEY.

Best 25 lbs. maple sugar,	Wm. A. White, New Road,	\$5
2d best do	W. B. Van Natten, New Scotland,	3
Best sample maple syrup, 1 gallon,	Wm. A. White, New Road,	3
2d best do do	W. B. Van Natten, New Scotland,	2

HONEY.

Best 20 lbs. honey,	H. W. Bulkeley, Ballston,	5
2d best do	B. J. Van Hoesen, Castleton,	3
3d best do	M. Quimby, St. Johnsville,	Trans.
Best bee hive,	R. C. Otis, Kenosha, Wis., "Longstroth's combined bee hive,"	S. S. M.
2d best do	Hays & Mitchell, Albany,	Dip.

CLASS VI.—DOMESTIC MANUFACTURES, &c.

No. 59. SILK AND WOOLEN GOODS—No. 1.

Best pair woolen blankets,	Mrs. J. B. Noyes, Salina,	\$8
2d best,	Miss F. Howard, La Grange,	6
3d best,	Miss Minerva Pine, Pittstown,	4
4th best,	Mrs. H. Weir, Johnsonville,	Trans.
Best 10 yards woolen flannel,	Miss Amelia Pine, Pittstown,	\$8
2d best,	Mrs. J. B. Noyes, Salina,	6
3d best,	Mrs. H. Weir, Johnsonville,	4
4th best,	Miss Jane Welling, Johnsonville,	Trans.
Best 10 yards woolen carpet,	Mrs. C. A. Markham, Albany,	\$8
2d best,	Daniel Conger, Wolcott,	6
3d best,	Mrs. T. C. Jones, East Groton,	4
Best hearth rug,	Mrs. J. G. Dickey, Constable, Franklin county, ...	4
Best rag carpet, 10 yards,	Mrs. Gardner Towne, Rutland,	6
2d best do	Miss Minerva Pine, Pittstown,	4
3d best do	Mrs. E. B. Lathey, Phelps,	2
4th best do	Mrs. Wm. Bovie, Pittstown,	Trans.

No. 60. DOMESTIC MANUFACTURES—No. 2.

Best double carpet coverlet,	Mrs. D. Conger, Wolcott,	\$6
2d best,	Miss Abigail F. Filley, West Troy,	4
3d best,	Mrs. Daniel Conger, Wolcott,	2

4th best, Miss S. J. Griswold, Berlin,.....	Trans.
Best knit bed spread, Mrs. L. S. Buel, Troy,.....	\$3
2d best, Mrs. G. Van Rensselaer, Albany,.....	2
3d best, Mrs. Edward Ogden, Troy,.....	1
Best white wove bed spread, Mrs. Dan'l Conger, Wolcott,.....	3
2d best, Mrs. H. Weir, Johnsonville,.....	2
3d best, Mrs. S. A. Benton, Earlville,.....	1
Best pair woolen socks for gentlemen, by girls under 12 years of age, Miss Ellen A Chamberlain, Watervale, Onondaga county,.....	2
2d best, Miss C. Yeomans, Euclid, Onondaga county,.....	1
Best 6 skeins woolen stocking yarn, Mrs. Emily Newcomb, Pittstown,.....	2
Best pair woolen knit stockings, Miss S. J. Griswold, Berlin,.....	2
2d best, Mrs. J. T. Van Namee, Pittstown,.....	1
Best pair worsted knit stockings, Mrs. J. B. Noyes, Salina,.....	2
2d best, Miss Amelia Pine, Pittstown,.....	1
Best pair woolen fringe mittens, Mrs. J. B. Noyes, Salina,.....	2
2d best, Miss Maria Witbeck, New Scotland,.....	1

Discretionary.

Mrs. Louisa Recoff, Albany, knit bed spread,.....	S. S. M.
Mrs. D. Conger, Wolcott, white wove bed spread,.....	Trans.
Mrs. Phebe Martin, Lansingburgh, linen bed spread,.....	S. S. M.
Hiram Harrington, Troy, case of worsted yarn,.....	Dip.
Mrs. Mary Cox, So. Sandlake, pair knit silk stockings,.....	S. S. M.
Mrs. J. H. Nichols, Troy, knit mariposa,.....	Barry.
Miss Mary Whitney, Greenbush, pair crotchet mittens,.....	Downing.
Miss Josephine Roof, West Troy, knit bed spread,.....	S. S. M.

No. 61. DOMESTIC MANUFACTURES—No. 3.

Best 10 yards linen, Mrs. H. Weir, Johnsonville,.....	\$8
2d best, Miss Jane Welling, Johnsonville,.....	6
3d best, Mrs. Henry Bailey, Bethlehem,.....	4
4th best, Mrs. H. Weir, Johnsonville,.....	Trans.
Best 10 yards linen diaper, Mrs. H. Weir, Johnsonville,.....	\$8
2d best, Miss Jane Welling, Johnsonville,.....	6
3d best, Mrs. J. T. Van Namee, Pittstown,.....	4
4th best, Mrs. Henry Bailey, Bethlehem,.....	Trans.
Best 10 yards linen kerseys, Miss Jane Welling, Johnsonville,.....	\$5
2d best, Mrs. J. T. Van Namee, Pittstown,.....	3
3d best, Miss Jane Welling, Johnsonville,.....	Trans.
Best 10 yards tow cloth, Mrs. H. Weir, Johnsonville,.....	\$4
2d best (bagging), Mrs. D. E. Mixton, Jordanville,.....	2
Best pair cotton knit stockings, Miss Minerva Pine, Pittstown,.....	2
2d best, Mrs. H. Weir, Johnsonville,.....	1
Best pair linen knit stockings, Mrs. E. Bishop, Attica,.....	2
2d best, Mrs. H. Weir, Johnsonville,.....	1
Best pound linen sewing thread, Mrs. H. Weir, Johnsonville,.....	2

Discretionary.

Miss Sarah Calkins, Lowville, for embroidered pillow cases,.....S. S. M.
 Mrs. H. Weir, Johnsonville, for linen knit stockings,.....Downing.
 Miss Jane Welling, Johnsonville, for knit stockings,..Ladies' Flower Gar.
 Mrs. Phebe Martin, Lansingburgh, for linen knit stockings (4 thread-
 ed),.....Am. Kitchen Garden.
 For knit stockings (linen),Rose Culturist.
 Mrs. Gardner Towne, Rutland, Jefferson county, 2 pairs linen stock-
 ings,Thomas.

No. 62. NEEDLE WORK.

Best silk embroidery, Mrs. W. H. Bridges, Troy, \$3
 2d best do Mrs. Amelia S. Bailey, Watson, 2
 3d best do Miss Mary Whiting, Greenbush, Pardee on Strawberry.

Best cape embroidery, Miss H. M. Dorr, Hoosick Falls,..... \$3

2d best do Miss J. E. Dickinson, Troy,..... 2
 3d best do Miss S. J. Griswold, Berlin,..Vinedresser's Man'l.

Best scarf and bag, embroidered, Mrs. W. H. Bridges, Troy, \$3
 2d best do do Miss A. Buel, Troy, 2

Best specimen Turkish do Miss Julia A. Sand, Knox,..... 3
 Best crotchet shawl, Mrs. H. McCauley, Albany,..... 3

2d best do Mrs. Oscar Tyler, Albany,..... 2
 3d best do Miss Harriet Priest, Troy,...Pardee on Strawberry.

Best crotchet table mats, Mrs. M. M. Pullan, \$3
 2d best do Miss Kate Downs, De Friestville,..... 2

3d do do Mrs. J. R. Green, Albany,Lady's Flower
 Garden.

Best specimen hair work, Mrs. U. Cornell Allen, Troy,..... \$3
 2d do do Mrs. Clara Yaumans, Albany, 2

3d do do Mrs. E. T. Crocker, Syracuse, . Ladies' Flower
 Garden.

Best knit hood, Mrs. W. H. Bridges, Troy,..... \$3
 Best original pencil drawing from nature, by lady, Mrs. J. H. Pea-

cock, Albany,..... 3
 2d best do Miss Minerva Whitney, 12 years old, Albany,..... 2

3d best do Mrs. Julia Ely, Watertown,..... Rose Culturist.
 Best specimen crayon painting, by lady, Miss E. J. Moore, Troy,... \$3

2d do do do Miss A. E. Barnes, Troy, .. 2
 3d do do do Mrs. J. P. Seeley, Albany, Vine-

dresser's Manual.
 Best oil painting, (figures) by lady, Miss Frances A. Moore, Albany, \$3

2d do do Miss E. J. Moore, Troy,..... 2
 Best oil painting, (landscape) by lady, Miss J. L. Buel, Troy, 3

2d do do do Mrs. Julia Ely, Watertown, .. 2
 Best water color painting, by lady, Miss A. Headlam, Albany, 3

2d do do Miss Jane C. Kerr, So. Kortright, 2

3d best water color painting, Mrs. C. A. Markham, Albany,.....Rose
Culturist.

Best original oil color drawing from nature, Miss C. R. Murdock,
Venice Center, Cayuga county,..... \$3
Best pastel painting, Miss Jane E. Callender, Albany,..... 3

Discretionary.

Mrs. O. H. Osborn, Albany, knit basket,..... Dip.
Miss Sarah Calkins, Lowville, 2 sets ladies' linen embroidery,..... Dip.
Pair child's embroidered drawers,..... Downing.
Miss Jane C. Kerr, South Kortright, two embroidered collars and
cuffs,..... Dip.
Mrs. W. H. Bridges, Troy, one infant's dress,..... Dip.
Mrs. H. McCauley, Albany, four crocheted bonnets,..... Dip.
Mrs. M. M. Pullan, New York, 4 crocheted tidys, Dip.
Mrs. C. W. Colton, Boonville, one knit worsted talma, Silver Sugar Spoon.
Mrs. Amelia S. Bailey, Watson, Lewis county, sample chenille em-
broidery,..... Dip.
Mrs. B. Payn, Albany, embroidered shawl,..... Dip.
Mrs. J. P. Seeley, Albany, oriental painting,..... Dip.
Miss Sarah E. Rollo, Greenbush, pencil drawing, Dip.
Miss Amelia A. Vallant, Albany, book of hair work and flowers,.... Dip.
Miss Lucy Howard, La Grange, Dutchess county, embroidered shirt, Dip.
Sarah S. Adams, Bethlehem, lace collar and cuffs,..... Dip.
Mrs. Amelia S. Bailey, Watson, Lewis Co., toilet cushion, ... Rose Cult.
Miss Kate Downs, De Freestville, embroidered muslin collars,..... S. M.
Miss A. S. Downs, De Freestville, embroidered morning dress,.. S. S. M.
Miss J. E. Dickerman, Troy, silk embroidered mantilla,..... Dip.
Miss C. A. Coon, Albany, one crocheted shawl,..... Dip.

SPECIAL.

Miss Margaret E. Skerrett, Albany, oil painting, "Scene in Italy," S. M.
Pencil drawing, "Female Head," Dip.
Oil painting, "Dream of Arcadia,"..... V. T.

No. 63.—NEEDLE WORK, &C.

Best specimen worsted embroidery, Mrs. Wm. Rector, Albany, \$3
2d do do Miss Hannah Smith, Albany, ... 2
3d do do Miss Mary McGuire, Troy, 3

Vinedresser's Manual.

Best chair, (cushion and back) Miss Mary L. Phillips, East Greenbush, \$3
2d do do Mrs. D. C. De Forest, De Freestville, 2
3d do do Mrs. S. A. Frink, Albany, .. Rose Culturist.
Best ottoman cover, Miss Sarah E. Bannister, Phelps, 3
2d do do Miss Julia A. Sand, Knox,..... 2
3d do do Annie E. Strever, Greenbush, 3

Rose Culturist.

Best embroidered table spread, Mrs. P. M. Wager, Troy,	\$3.
Patchwork table spread, John Sintzenich, 65 years old, Albany,	2
Best silk bonnets, domestic, J. A. O'Brien, Albany,	3
2d do do G. G. Gregory, Troy,	2
Best ornamental shell work, Mrs. E. T. Crocker, Syracuse,	3
2d do do Mrs. Wm. Richardson, Albany,	2
3d do do Mrs. F. W. Payne, Albany,	

Vinedresser's Manual.

Best specimen wax flowers, Mrs. E. T. Crocker, Syracuse,	3
2d do do Mrs. Emeline Hicks, Lansingburgh,	2
3d do do Mrs. H. Hayward, Lewiston, .. Florist's Guide.	
Best white quilt (stuffed), Mrs. P. R. Carhart, Albany,	3
2d do do do do	2
3d do do Mrs. S. A. Benton, Earlville, Florist's Guide.	
Best transposed quilt, Mrs. J. L. Treat, Auburn,	\$3
2d do Mrs. James Tefft, Ticonderoga,	2
3d do Miss Hannah Witbeck, New Scotland, .. Rose Cult.	
Best patchwork quilt, Mrs. B. Payne, Albany,	\$3
2d do Mrs. Edward Ogden, Troy,	2
3d do Mrs. Sarah Maxwell, Albany, Rose Culturist.	
Best specimen plain sewing, Miss Mary Whiting, Greenbush,	\$3
2d do do Mrs. J. H. Loucks, Feura Bush, Albany co. 2	
3d do do Mrs. H. Weir, Johnsonville, .. Rose Culturist.	

Discretionary.

Mrs. A. S. Pease, Albany, silk and velvet patchwork chair, cushion and back,	S. S. M.
John Sintzenich, Albany, patchwork quilt, made by a man 65 years of age,	V. T.
Miss S. A. Statts, Albany, specimen of wax flowers,	Rose Culturist.
Mrs. Wm. Richardson, Albany, specimen of sea mosses, bound, ..	S. S. M.
Adolphus Sinsheimer, Albany, suit of embroidered clothes, for boys and girls,	S. S. M.
Mrs. Amelia S. Bailey, Watson, Lewis county, lamp mat, embroidered slippers, and embroidered basket,	Dip. and Rose Culturist.
Mrs. H. Clapper, Albany, patchwork quilt,	Rose Culturist.
Mrs. Jonas Whiting, Greenbush, transposed quilt,	Barry.
Mrs. John Wilcox, Albany, worsted embroidered picture,	S. S. M.
Miss H. J. Godden, Albany, embroidered skirt, . Ladies' Flower Garden.	
Eleanor Jordan, Greenbush, leather work frame,	Garden Manual.
Miss C. A. Sage, (12 years,) West Troy, three new styles fancy tape trimming,	Dip.
Miss S. C. Peak, Hudson, case wax flowers,	Rose Culturist.
Miss S. E. Peck, Catskill, worsted embroidered picture, Dip. and S. S. M.	
Mrs. R. A. Van Patten, Albany, three vases wax flowers,	S. S. M.
Mrs. Adam Dings, East Greenbush, patchwork quilt,	Rose Culturist.

Mrs. T. H. Wands, Collamer, patchwork quilt, Norton.
 Mrs. James Mc Clure, Albany, silk patchwork quilt,..... Thomas.
 Mrs. E. T. Crocker, Syracuse, hair wreath, S. M.
 Mrs. J. H. Nichols, Troy, cone burr picture frame,..... S. S. M.
 Miss Jane A. Baker, Albany, patchwork quilt,..... S. S. M.
 Mrs. I. S. Wolcott, Albany, patchwork quilt, Barry.
 Anthony Will, Syracuse, specimen of wax work,..... Dip.
 Mrs. Jacob M. Finkle, Eagle Mills, wax fruit and flowers, S. S. M.
 Mrs. F. S. Bull, Albany, patchwork quilt,... Barry.
 Gordon & Ballou, Albany, embroidered piano covers, (not domestic,) Dip.
 Mrs. J. G. Farnsworth, Albany, wax flowers, Thomas.
 Miss Lucy Howard, La Grange, collection of needle work,..... S. S. M.
 Miss F. Howard, La Grange, worsted embroidered slippers,.....

Ladies Flower Garden.

Miss Sarah M. Baker, Albany, ottoman covers, Rose Culturist.
 Mrs. John Tilley, West Troy, patchwork quilt, Florist's Guide.
 Miss C. Reed, Albany, patchwork quilt, Breck's Book Flowers.
 Mrs. J. Pepinbrink, Albany, silk patchwork quilt, Rose Culturist.
 Mrs. C. R. Sykes, Troy, worsted embroidered picture, .. Florist's Guide.
 Mrs. H. Weir, Johnsonville, specimens gent's linen,..... S. S. M.
 F. M. Goewey, Albany, shell box,..... Barry.
 Mrs. G. Lusk, Coxsackie, silk patchwork quilt,... Pardee on Strawberry.
 Mrs. George M. Barker, Granville, silk patchwork quilt,.....S. S. M.
 Mrs. C. C. Greenwood, Troy, silk patchwork and embroidered quilt,

Florist's Guide.

Mrs. D. L. Wing, Albany, toilet cushions,.....S. S. M.
 Mrs. Emily Webster, Troy, patchwork quilt, Barry.
 Miss Milissa E. Yeomans, Euclid, Onondaga county, embroidered
 linen,..... S. S. M.
 Miss Eliza Bannister, Phelps, worsted embroidery,Florist's Guide.
 Miss A. W. Park, Troy, case hair work,..... S. S. M.
 Mrs. G. W. Dodge, New Berlin, patchwork quilt, Barry.
 Mrs. E. Huyck, embroidered slippers,..... S. S. M.
 Mrs. M. Blanchard, Troy, hair flowers, wax flowers, and book rack, Dip.
 Mrs. D. C. Mears, Albany, transposed quilt,..... Downing.
 Mrs. Sarah Baker, Albany, fancy paper cutting,..... Dip.
 Mrs. S. S. Payn, Albany, paper flower bouquets,..... S. S. M.
 Miss Margaret Bedel, East Greenbush, patchwork quilt, S. S. M.
 Miss Mary E. Bannister, Phelps, plain sewing, Rose Culturist.
 Miss S. J. Griswold, Berlin, Rensselaer county, bouquet paper flow-
 ers,..... S. S. M.

CLASS 7.

No. 64.—PAINTINGS, &c.

Best specimen of animal painting, in oil, by American artist, Thomas

K. Van Zandt, Albany, Dip. and Silver Medal.

Best drawing of show grounds for society, H. E. Pease, Albany,....	Dip.
Best flower or fruit painting, A. Parton, Hudson,.....	Dip.
Best photograph of animals, James Irving, Troy,	Dip.
Best architectural drawings, S. E. Hewes, Albany,	Dip.
Best lithographs, H. E. Pease, Albany,.....	Dip.
Best daguerreotypes, R. E. Churchill, Albany,	Dip.
Best collection of photographs, H. Wendell, Albany,.....	Dip.
Best collection of ambrotypes, James Irving, Troy,.....	Dip.
Best specimen of bookbinding, E. H. Bender, Albany,	Dip.
Best specimen of printing, Joseph Russell, New York,	Dip.
Best handbill for agricultural societies, C. Van Benthuyssen, Albany,	Dip.
Best specimen of ornamental penmanship, Bryant & Stratton, Albany,	Dip.
Best specimen of business penmanship, do do	Dip.
Best specimen of sign painting, Wm. Kelly, Troy,.....	Dip.

Discretionary.

S. M. Bassett, Syracuse, ornamental penmanship,	Dip.
Robert Price & Co., Albany, photographs on wood, for printing,....	Dip.
Hiram Ferguson, Albany, engravings from photographs on wood,....	Dip.
Thomas S. Murphy, Albany, best law book binding,	Dip.
Lewis R. Gregory, Albany, scrip and fancy lettering,	Dip.
Gavit & Co., Albany, engraved cards, portraits, and envelopes,....	Dip.
O. B. Evans, Buffalo, admirable and life-like photographic portrait of Col. B. P. Johnson, Secretary Agricultural Society,	Dip.
Bryant & Stratton, Albany, useful and perfect series of Spencerian writing books, for schools and counting-houses, and highly com- mended manuscript book keeping,.....	Dip.

No. 65. SILVER WARE, CUTLERY AND BRITANNIA.

Best set dental instruments, N. D. Ross, Troy,	S. M.
Best set mathematical instruments, and best surveyors' instruments, W. & L. E. Gurley, Troy,.....	S. M.
Best specimen plated ware, R. Strickland, agent Albany Plate Co.,...	S. M.
Best exhibition dentistry work, Ross & French, Troy,	S. M.
Best barometer for common use, H. A. Simmons, Fulton, Oswego county,	S. M.
Best family preservatory or refrigerator, E. Wood, Troy,.....	S. M.

Discretionary.

W. & L. E. Gurey, Troy, solar compass and farm levelling instrument,	S. M.
T. C. Schryver, Troy, plated horse and carriage trimmings,	S. M.
James Mix, Jr., case firemen's silver trumpets,	S. M.
W. Brown, Albany, plated trimmings to engine No. 8,	Dip.
E. Kendall, New Lebanon Spa, aneroid barometer,.....	Dip.

No. 66. STOVES (COOKING).

Best elevated oven cooking stove, for wood fire, Rathbone & Co., Albany,	S. M.
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- Best low oven cooking stove, for wood fire, Treadwell, Perry & Norton, Albany, "Economist," S. M.
 2d best low oven cooking stove, for wood fire, Munsell, Thompson & Munsell, Troy, "Leader," S. S. M.
 Best low oven cooking stove, for coal, Rathbone & Co., Albany, "Good Samaritan," S. M.
 2d best, Hicks, Wolf & Co., Troy, S. S. M.
 Best cooking range, for families, and cooking stove, for coal, E. Backust, Stuyvesant, Columbia county, S. S. M.
 2d best, Van Wormer & McGarvey, Albany, S. S. M.
 Best furnace or other apparatus for warming houses, economy of construction and consumption of fuel, and security of premises and facility for ventilation, taken into consideration, J. C. Henderson, Albany, S. M.

Discretionary.

- Calvin Pepper, Albany, gas and sand heating cook stove, V. T.
 Munsell, Thompson & Munsell, Troy, coal cook stove, "Leader," V. T.
 Billings & Stow, Troy, low oven cook stove, wood or coal, "Battle Ground," V. T.
 N. W. Northrup, Greene, Chenango county, low oven cook stove, wood or coal, "Helen Mar," V. T.
 Charles Eddy, Troy, gas burner cook stove, low oven, coal, V. T.
 Hicks, Wolfe & Co., Troy, Low oven cook stove, "Adriance," portable heater, Dip.
 Van Wormer & McGarvey, Albany, portable heater, V. T.
 T. W. Chatfield, Utica, hot air furnace, V. T.
 Starbuck Bros., Troy, furnace heater, Dip.
 Van Wormer & McGarvey, Albany, agricultural cauldron, Dip.
 P. W. Lamb, Albany, sheet iron cylinder coal stove, V. T.
 Quackenbush & Wasson, Albany, box stove, "Tallyho," V. T.
 Hubbard & Russell, Albany, 1 heater, and 1 rural heater, V. T.
 H. G. Bulkeley, Kalamazoo, Michigan, heater for warming houses by superheated steam, Dip.

No. 67. STOVES, (PARLOR.)

- Best ornamental parlor stove, Treadwell, Perry & Norton, Albany, "Star of the North," (oval) Silver Medal.
 2d best, H. G. Giles, Rochester, "Empire Gas Burner," S. S. M.
 Best hall stove, Van Wormer & McGarvey, Albany, S. M.
 2d best, Treadwell, Perry & Norton, Albany, "Blazing Star," S. S. M.
 Best sample hollow ware, Winne & Abeel, Albany, S. S. M.
 Best fire grates, J. C. Henderson, Albany, S. M.
 Best and largest exhibition of stoves, Rathbone & Co., Albany, S. M.
 Best exhibition of fire grates for dwellings, J. C. Henderson, Albany, S. S. M.

Discretionary.

- L. Potter, Troy, parlor wood stove, "Novelty," Dip.
 David G. Stafford, Syracuse, self regulating parlor coal burner, Dip.

No. 68. LEATHER, INDIA RUBBER GOODS.

- Best specimen of trunks, L. M. Rogers, Albany, Dip.
 Best carpet bags, L. J. Loyd, Albany, Dip.
 Best ornamental leather work, Miss Delia Shaver, Nassau, Dip.
 Best sole and upper leather, and best calf skins, W. W. Wright, New-
 burgh, Dip.
 Best colored roans and linings, George Sims, Troy, Dip.
 Best exhibition of boots and shoes, J. L. Randall, Albany, Dip.

Discretionary.

- John O. Grady, Saratoga, Spa., for French calf quilted boots, Dip.
 Anable, Smith & Rathbone, Albany, colored roans, shoe linings and
 russet leather, Dip.

No. 69. CABINET WARE.

- Best assortment bedsteads, Foot & Hasey, Albany, Dip.
 Best rosewood chairs, Merrifield & Wooster, Albany, Dip.
 Best rosewood sofa, Merrifield & Wooster, Albany, Dip.
 Best bedstead, Merrifield & Frederick, Albany, Dip.
 Best table, H. D. Baker, Pittstown, Dip.
 Best spring bedstead, Geo. F. Gray, New York city, "Howe's Patent
 Eliptic," Dip.
 Best exhibition of mirrors, J. Burton & Co., Albany, Dip.
 Best exhibition of picture frames, J. Burton & Co., Albany, Dip.
 Best exhibition of window shades, Gordon & Ballou, Albany, Dip.

Discretionary.

- Gordon & Ballou, Albany, window curtains, Dip.
 R. K. Viele, Albany, 10 varieties of furniture, Dip.
 Ephraim Brown, Lowell, Mass., patent alarm money drawer, S. M.
 Merrifield & Wooster, Albany, marble top center table, S. M.
 Wm. Kellogg, New York, oriental spring bed bottoms, S. M.
 Hutchinson & Wickersham, New York, Howe's elliptic spring bottom
 and iron folding bedstead, combined, Dip.
 Josephus Baldwin, Nashua, N. H., economical machine carved bed-
 stead, Dip.

No. 70. CARRIAGES.

- Best double carriage, Haight & Hubbell, Bridgeport, Conn., Dip.
 Best single top buggy, L. Chamberlain, Troy, Dip.
 Best single riding buggy, Wm. Lown, Troy, Dip.
 Best pleasure wagon, Long & Silsby, Albany, Dip.
 Best double sleigh, Kingsbury & Whitehead, Albany, Dip.
 Best single sleigh, James Goold & Co., Albany, Dip.
 Best collection of carriages and wagons, James Goold & Co., Albany, Dip.

Discretionary.

Wm. Lown, Albany, 1 coach,	Dip.
Hubbell & Johnson, Albany, three seated wagon,	V. T.
James Goold & Co., Albany, pony sleigh,	V. T.
H. McDonald, Albany, new style single sleigh,	Dip.
Witbeck & Jones, West Troy, 1 carriage,	Dip.
Long & Silsby, Albany, top buggy,	V. T.
A. Brewster, Albany, hearse,	Dip.
Bliss & Howland, Union Springs, Cayuga county, hickory carriage rims,	Dip.
John Davis, Sandy Creek, Oswego county, patent top buggy,	Dip.
E. G. Chant, Albany, Lord's patent perch coupling for buggies,	Dip.

No. 71. CLOTHING, &c.

Best exhibition of gentlemen's ready made linen, A. J. Nutting, Troy, Dip.

No. 72. MISCELLANEOUS.

Best exhibition of paste blacking, A. D. Rosekrans, Albany,	Dip.
Best exhibition of perfumery, Isaac L. Allen, Albany,	Dip.
Best tomato catsup, A. D. Rosekrans, Albany,	Dip.

Discretionary.

A. D. Rosekrans, Albany, leather preservative,	V. T.
H. E. Pease, Albany, card engraving,	S. M.
Lithographic presses,	V. T.
George H. Curren, Albany, lettering on marble,	Dip.
H. H. Burhans, Albany, smalt and gravel cement roofing,	Dip.

No. 72 A. SEWING AND KNITTING MACHINES.

Best family sewing machine, Armitage & Mosely, Troy, for "Wheeler & Wilson's," and to Grover & Baker, New York city, for "Grover & Baker's"	Diploma to each.
Best machine for manufactories, Wilson & Walker, Albany, for "Ladd, Webster & Co.'s,"	Dip.
Best double thread machine, Armitage & Mosely, Troy, for "Wheeler & Wilson's," and Grover & Baker's, for "Grover & Baker,"	Diploma to each.
Best single thread machine, Joseph W. Bartlett, New York city, for Bartlett's patent novelty self threading,	Dip.
Best sample of work on sewing machine, K. V. R. Lansingh, Albany,	Dip.
Best knitting machine, Fuller & Safely, Cohoes,	Dip.

No. 72 B. PIANOS AND MUSICAL INSTRUMENTS.

Best Grand Piano, J. Collier, Albany, "Chickering & Sons,"	Dip.
Best square grand, Boardman, Gray & Co., Albany,	Dip.
Best small Young America or Cottage Piano, Boardman, Gray & Co., Albany,	Dip.

Discretionary.

Grant, Viall, Nutting & Co., Troy, wire cloth screens, sieves, &c., . . Dip.

No. 72 C. DOMESTIC PURE WINES, &c.

Best native wine, P. Stewart, New Lebanon,	Dip.
Best current wine, Mrs. Emeline Hicks, Lansingburgh,	Dip.
Best blackberry wine, Avery Herrick, Albany,	Dip.
Best elderberry wine, Henry Swyer, Troy,	Dip.
Best raspberry wine, Avery Herrick, Albany,	Dip.
Best tomato wine, Avery Herrick, Albany,	Dip.
Best cider vinegar, George K. Montgomery, West Troy,	Dip.

Discretionary.

Wm. Fleming, Albany, "Golden Ale,"	S. M.
Avery Herrick, Albany, Cherry Bounce,	V. T.
Avery Herrick, Albany, Strawberry wine,	Downing.
Mrs. F. W. Payne, Albany, cranberry wine,	S. S. M.
Mrs. Emeline Hicks, Lansingburgh, tomato catsup,	Rose Cult.
B. P. Cohoon, Keneosha, Wis., rhubarb wine,	Dip.
Henry Swyer, Troy, golden nectar wine,	V. T.

No. 72 D. *Discretionary.*

To B. P. JOHNSON, *Sec'y N. Y. State Ag. Society*:

The undersigned, members of Discretionary Committee, No. 72 D, beg leave to report:

That notwithstanding a division has been made of the labor formerly assigned to this committee, yet we found upon our list some three hundred entries, embracing every conceivable article usually exhibited on similar occasions, varying from the magnificent railroad car to the tiny, yet elegant child's carriage; from Hoe's fast rotary printing press, down through all grades of strange and wonderful machinery, to an improved brake on a model farm wagon. We find also on our list, miniature steam engines, which are on the spot, in full operation, fresh from the land of the Lilliputs; also every variety of tools, from the saw and axe to the smallest chisel, of dimensions so minute as to be of use only to the aforesaid diminutive race. Science, too, has contributed largely to our list, rendering our duties still more difficult, as each article is supposed to develop some new principle, or apply a known one to some useful invention, the full particulars of which, in any single instance, would absorb the entire space allotted us; therefore could your committee, instead of being mostly practical farmers, reckon among their numbers a modern Archimedes, Newton, Bacon, Fulton, or all of them, yet for want of time to make investigations sufficiently thorough, we should be entirely unable to do full justice to the exhibitors; but notwithstanding the difficulties in our way, we have done the best we could. Some articles on our list could not be found, and some required explanations that no one was present to furnish; there were, besides, many articles on our list which are in general use, and require no recommendation from us to add to the public recognition of their merits. Our awards are as follows:

J. L. Alberger, Buffalo, for Schooley's preservatory, Dip.
 Wm. W. Hewitt, of New York city, had on exhibition five of Sandford's refrigerators. The above appear to be rivals, Hewitt claiming that Schooley's is an infringement upon Sandford's patent. The main point of difference appears to be that, in Hewitt's the air passes under and through the ice, while in Schooley's the bottom is air-tight, the air only passing around the ice; hence they claim that the same quantity of ice will last much longer and perform the same business, which, from our limited investigation, we thought to be true, and if so, an important consideration.

There were quite a number of grindstones on the ground, which, although they do not make as great pretensions as some other articles, yet few are really of more practical importance to the farmer. All appeared to be good. We award a Diploma.
 Horace Averill, Albany, for Lake Huron grindstone,

A. T. Becker, Cohoes, case miniature tools, Diploma.

It is difficult to understand the importance of this case of beautiful tools, unless some modern Gulliver should discover a community of Lilliputians, in which case they would doubtless find a ready market; they display ingenuity and skill. We trust that in future the case will contain the full sized article.

Hostetter & Smith, Pittsburg, Pa., for Hostetter's celebrated Stomach Bitters, Diploma.

Bacon & Stickney, Albany, samples coffee, spices, and mustard, . . . Diploma.

Roy & Co., West Troy, for case of wrought iron butts, hinges, nuts, and washers, Diploma.

These goods are widely known and appreciated for their excellence and durability. In regard to the progress of the business, the manufacturer says: That the manufacture of patent wrought iron butts and hinges commenced in this country at West Troy, N. Y., under the direction of James Roy, about twenty-five years ago. At that time the prejudices of the public were all in favor of cast goods, and it was with great difficulty that any sales were made, as the cost at that time was double that of cast butts. By a long experience in the manufacture of the wrought goods, they can now be afforded at the same cost as cast butts, and are now almost universally used throughout the country. The straps and T hinges now take the place of many kinds of heavy "old pattern" hinges, and have almost entirely superseded the English hinges in the market.

E. B. Orcutt, Albany, for samples stoneware, Pat. O. R.

James Patten, Dowagiac, Mich., for patent self-balancing sash-raiser and lock combined, Diploma.

This was a very ingenious arrangement for raising, lowering, and locking window sash; the one on exhibition worked admirably.

William Holroyd, Waterford, stocks and dies, Diploma.

Bell & Duley, Albany, for samples of wood carving, P. O. R.

- S. T. Savage, Albany, for parlor ash-sifter, furnace bars, and cast iron self-locking malt tile, Diploma.
- L. Annesley & Co., Albany, for a large and elegant display of pier and mantel mirrors, ornamental and oval picture frames, and prepared gilt and rosewood mouldings, S. M.
- Nathaniel Wright & Co., Albany, for a splendid display of silver plated coach and harness trimmings, gig saddles, bridle fronts, &c., Dip.
- W. Harvey, Albany, for model of patent safety joint, for securing end of T rails, Dip.
- P. A. Raynor, Williamsburgh, for specimens of artistic confectionary, Vol. Trans.
- Geo. H. Curren, Albany, for lettering on marble, Vol. Trans.
- Mrs. John McDuffie, Albany, for specimens of scouring and dyeing, Barry.
- Theodore Youmans, Albany, for an elegant display of hair jewelry, .. Dip.
- Lawyer, Schermerhorn & Co., Albany, for specimens of plain and decorative paper hangings, Dip.
- Ridgeway & Co., Albany, for case of brass cocks, lead pipe, boiler and stand iron, sinks, pumps, &c., all very good, and worthy of more than passing notice, Dip.
- Geo. R. Comstock, Little Falls, for model of a cotton press, and model of a canal steamboat, V. T. and Dip.
- Mr. Comstock claims to have invented a paddle which will supersede all others on our canals; they are situated each side of the rudder, occupying very nearly the entire stern of the boat; they are arranged with slats, which close for the propelling stroke, and open for the return, thus furnishing the entire surface for resistance in the former, and but slight resistance in the latter.
- Lambert Dries, Albany, for rosewood inlaid work-box, 1,702 pieces, elegantly arranged, P. O. R.
- James A. Hurst, Albany, for specimens of stuffed animals and birds, a large and attractive collection, Dip. and S. S. M.
- Alex. Greer, Albany, for cut tobacco, snuff, and cigars, Dip.
- D. Van Wart, Albany, for chemical leads, a superior article of stove polish, Dip.
- Milton H. Bassett, New York city, for sample of Spalding's prepared glue.
- This article is simply the best of glue, held in solution by some chemical agency, so that it is constantly ready for use. Any housekeeper can see at a glance its convenience and absolute utility. Any broken or mutilated article about the house, from the side board to the finger glasses, can be easily mended or repaired by using this article. It is put up in convenient sized bottles, with a brush ready for use; no family should be without it.
- We award a S. M.
- L. J. Loyd, Albany, for horse blankets, P. O. R.
- M. Vanderhoff, New York, samples of grain, flour, and salt bags, .. Dip.
- These grain bags are said to be equal, in all respects, to the seamless, and cheaper.

Van Heusen & Charles, Albany, specimens of planished ware, ornamental coffee pots, and fancy Japanned trays,.....Dip.

This ware is really beautiful, and seems to be susceptible of a finish nearly or quite equal to silver. The tea trays, we are informed, are from the only manufactory in this country, and are deserving of high commendation for strength, elegance of design, and beauty of finish.

Van Wormer & McGarvey, Albany, for Japanned and galvanized coal hods,V. T.

John Bartlett, Albany, 3 elks,.....V. T.

E. Wood, Troy, for Polar refrigerators,.....Dip.

Dusenberry & Anthony, Troy, for sample of cream tartar,.....V. T.

Wm. Manson, Albany, for specimens of American and Italian carved mantels, sculptured marble monuments, and marble work of various designs—a large and splendid collection, worthy of special notice.

We award a.....Silver Medal.

Winant & Witbeck, Troy, for a fancy vaneered dress box,.....V. T.

Chas. Schlemmer, East Schodack, fancy work basket,.....V. T.

Henry Hisgen, Albany, for wild deer and wild goose,.....P. O. B.

Benj. M. Briare, Albany, for specimens of ornamental confectionery, very superior,.....S. M.

S. H. Sankey, Albany, for model of a schooner,V. T.

Augustus Viele, West Troy, for cast iron water pipe,Dip.

P. F. Hall, Troy, for railroad coupling or chair, apparently an improvement,Honorable Mention.

Mallory & Engles, Troy, 5 railroad car wheels,Dip.

It is claimed that on account of the peculiar construction of these wheels, they are able to resist a much greater pressure than those in common use. Your committee would suggest that the desideratum claimed is worthy to be investigated by railroad men.

G. B. Van Zant, Albany, for monumental headstones,.....V. T.

Mrs. F. M. Payne, Albany, exhibited a China tea cup and saucer, and a warming pan, purchased in 1770—interesting only as relics of a former century,.....V. T.

Isaac L. Allen, Albany, for patent Empire wash tub,.....V. T.

D. S. Horton, Troy, child's carriage, an elegant and luxurious affair, eminently adapted for airing mamma's pet. We award a.....S. S. M.

We find the following entry on our book:

L. H. Hills, Hudson, Hills' air light.

Your committee were not only anxious to do justice to the exhibitor, but were very curious to see this celebrated light, but searched for it in vain.

John G. White, Albany, perforated sheet iron for malt kilns.

Several specimens of this article were exhibited by different individuals, some manufactured by machinery, and some by hand; and so far as your committee were able to discern, were equally meritorious.

D. J. Kellogg, Rochester, patent photographic trays,Dip.

This article is supposed to be valuable to the trade, in that it saves a

large amount of the solution of silver, required by the ordinary plunge bath system for coating the plates.

M. Craver, Albany, Cataract washing machine,.....Trans. Inst.

There were quite a number of washing machines on exhibition, all of which doubtless have some points of excellence, and as labor-saving machines for the kitchen, are all more or less meritorious.

Dan'l Budd, Albany, carpet fasteners, a very desirable article,.....V. T.

H. Burden & Sons, Troy, machine made horse shoes,.....S. M.

The committee were politely invited to visit the works of Messrs. Burden, and witness the operation of their horse shoe machine, and regretted exceedingly that their duties on the fair ground made it necessary for them to deny themselves the pleasure which such a visit would have afforded. The shoes are very well executed, indeed much better and more uniform than those made by hand. In reply to questions of the committee, in regard to said shoes and the method and progress of their manufacture, the exhibitors say: "The manufacture of horse shoes has been carried on by Mr. Henry Burden, of Troy, N. Y., for many years, by machinery of his invention, but not with a great degree of success until recently. The shoes made by his original machine were justly liable to objections. But, after many experiments, Mr. Burden has succeeded in perfecting a machine adapted to every variety of shoe. This machine takes a bar of iron as it comes from the rolls of the mill, and converts it into shoes of any desired pattern, at the rate of one per second, and would do so all day and all night long, could the iron be supplied without stopping. It makes the shoe of the same pattern, with perfect uniformity, and distributes the iron precisely as it is required. The saving by the use of these shoes is not less than fifty per cent. The rapidity with which they are made, the small cost of attending the machine, its enormous capacity (one of them making thousands of tons a year), enable the manufacturers to supply the market with shoes of any desired shape and weight, at a fraction above the cost of iron, which sooner or later must inevitably cause them to take the place of all hand-made work. These shoes are used upon all the horses and mules in the United States service; they have also been adopted by the government of Austria; and the manufacturers are in negotiation with several foreign countries for their introduction abroad."

Thomas Kereduque, Hillhouse, O., samples of wood toilet ware,.....Dip.

Jno. A. Goeway, Albany, baggage checks, car and switch locks, and

letter press (very good),.....Dip.

Eaton, Gilbert & Co., Troy, horse railroad car,.....Dip.

A splendid affair. It has, connected, a very ingenious contrivance for depositing the fare by the passenger; the driver can witness the entire operation, but cannot finger the change himself. Supposed to be pecuniarily important to proprietors, and conducive to honesty on the part of drivers, virtues which should not be overlooked by purchasers.

Frederick Eells & Son, Troy, patent cattle cards,.....Dip.

Jno. Beardsley, Little Falls, model of adjustable iron chord bridge,..Dip.

There are many merits claimed for this bridge, of which, however, we had not time to satisfy ourselves fully, but should think the adjustable iron chord a valuable improvement; we cheerfully commend it to the consideration of those interested.

Moore & Nims, Troy, artificial globes, Dip.

Corning, Winslow & Co., Troy, samples of nail spikes and rivets, also railroad chairs and car axles, Dip.

Geo. Race & Bros., Norwich, Chenango county, clothes dryer, Dip.

D. M. Pease, Concord, Lake county, O., ladies' toilet ware, Dip.

Chas. Kethern, Cleveland, Oswego county, for superior samples of car and window glass and glass cylinder, Dip.

E. A. Selkirk, Albany, specimens of Biotina roofing and cement paint, Dip.

C. W. Marston, New York city, specimens of water-proof composition, V. T.

D. J. Johnson, Cohoes, weaving loom, Dip.

J. W. Vincent, Westerly, R. I., mince pie meat and apple cutter, ... Dip.

James McDonald, Jr., Albany, case of insects, S. S. M.

This is quite a large case of insects, caught and arranged in beautiful style by Master J. McDonald, and gives evidence either of extraordinary natural talent, in this department of natural science, or of superior cultivation. In either case much credit is due.

T. Robinson Rogers, Jersey City, Dixon's Carburet of iron stove polish, Vol. Trans.

Judging from samples of work done with this article, we deem it the ne plus ultra of stove polish.

P. Perry, Troy, model of combination mill, Diploma.

Great things are claimed from this combination, but the committee lacked the requisite time to investigate.

L. B. Storrs, Canton, St. Lawrence co., pressing machine for tailors' use, Diploma.

This machine is a cast iron arm, with all the flexibility and motions of the natural, requisite for the performance of the work of pressing, with a vast increase of power. Were we tailors, we should avail ourselves of its ironing services forthwith.

F. A. Redington, Fredonia, N. Y., Empire Dairyman, for the manufacture of cheese, S. M.

This machine is simply a vat and steamer most admirably arranged for the business of cheese making, so that cheese can be manufactured from the milk of fifty cows, with less labor than would be required for ten before the era of vats and steamers. There are other and similar apparatus which, in many respects, perhaps in most, are equal to this one, but the committee are of the opinion that Mr. Redington's possesses advantages over them all.

H. G. Bulkeley, Kalamazoo, Michigan, agricultural boiler and evaporator, Diploma.

Fleming & Hay, N. Y. city, Kaliston oil distilled from coal; solidified milk; self-ventilating cake box, and patent screen to cans and jars; an array of useful articles worthy of especial commendation, Dip. W. B. Billings, N. Y. city, Union light and gas burning lamp, S. M. A very brilliant and beautiful light.

Dr. D. Bly, Rochester, artificial leg, S. M.

History teaches us that now and then a man of uncommon genius will arise and accomplish an ultimatum in some given direction of scientific research or mechanic art, or both combined; this, it seems to us, is the case in regard to Dr. Bly and his artificial leg. Nothing can possibly more entirely imitate and replace the natural leg. It is light and strong; it is capable of adjustment to the stump, without causing pain or material inconvenience to the wearer; it is symmetrical and elegant in its proportions, and when covered with a stocking would not be detected; but its crowning excellence consists in the flexibility and perfectly natural motion of the joints, and the easy adaptation of the foot to any position, or on any uneven surface, operating in all respects like the natural. And the motion or action of the leg in the act of walking, on account of the rubber springs or muscles with which it is furnished, instead of hitching or dragging, as is generally the case, is elastic, buoyant, natural; and we repeat, it is difficult to surmise what further can be accomplished in this direction. The doctor had a gentleman in company with him who wore two of them, and it was really surprising to see with what ease, with only a cane, and sometimes without even that aid, he could not only walk about, but could do so easily and gracefully. The doctor has proved himself, not only a man of science and a first class inventor, but a public benefactor also; and we feel sure that those who have been so unfortunate as to be deprived of either or both of their legs, will learn by the use of his artificial ones to so regard him. Jenks & Brown, Cohoes, samples of cotton goods, Dip. H. Cogswell, Greenwich, N. Y., case of patent hames, Dip. E. S. Gerdon, Albany, a very ingenious and remarkable padlock, . . . Dip. J. Spaulding, Saratoga, saw set, V. Trans. Joseph Ditto, N. Y. city, patent Mica and fibrous cement roofing, . . . Dip. A. C. McFarland, Albany, exhibition of manufacturing candies, . S. S. M.

This manufactory was in full blast on the ground, not only manufacturing, but dispensing sweets to the multitude. The committee, being all men of taste in regard to the quality of the article, consider themselves competent to judge fully of its merits. We pronounce it superior.

G. W. Dean, Glens Falls, Dean's adjustable cylinder tuyre, . . . V. Trans. J. H. R. Priest, N. Y. city, Ellery's patent India rubber paint and cement, Dip.

Among the innumerable commodities, which are wholly or in part from rubber, we now have paint of all the various colors except white, for which it is claimed that it has the advantage over lead or zinc paints in cheapness and durability—important items, which, if true, will, of course, very soon bring it into general use.

Ostrander & Heart, Troy, samples of fire brick, Dip.
 Clifton Co., (W. Stone, agent,) Cohoes, samples of knit shirts and
 drawers, Dip.
 Thomas Jefferson, Buffalo, model fire engine in working order, Dip.
 J. C. Shuler & Co., Amsterdam, metallic burial cases, Dip.

These burial cases are manufactured of galvanized iron, perfectly impervious to water or air, and finished in any desired style. It is claimed for them, that they are lighter and cheaper than the cast iron burial cases, and equally indestructible and tight.

A. O. Miles, agent, Nashua, N. H., White's patent money drawer, ... Dip.

A very ingenious contrivance, both to baffle and detect rogues.

M. M. Jones, Schenectady, model of slate roof, V. Trans.

H. Littlejohn, Troy, hoop lock cutter, V. Trans.

This instrument, at one stroke, cuts the lock on one end of a hoop ready for setting. We commend it to the consideration of coopers as likely to prove a valuable labor saver.

A. Hallock, Queens, Queens co., case of fruit boxes, Dip.

Horace Vaughn, Phila., Pa., process for lubricating, called the cooling compound solution; process of hardening steel, and wrought and cast iron, Dip.

In regard to the cooling compound, the committee have been shown a letter from the superintendent of the Beaver Meadow R. R. & Coal Co., in which he says: "Mr. Horace Vaughn: Sir—I find that since we have used your cooling compound or liquid, the locomotive engines on our road have run, in July, ninety-six miles, and in August one hundred and thirty miles per quart of oil. In April last, when we did not use your oil or liquid, the average was fifty-six miles run for one quart of oil used; we used lard oil on our locomotive engines only." If the half of the above will hold true, it would be difficult to compute the immense saving which would ensue to the railroad interest in this country by its adoption. In regard to the process of hardening steel and iron, we were unable to judge; but he claimed to temper edge tools so nicely, that iron could be cut with them without detriment. Some persons might think he claimed too much, but time will determine.

Young & Cook, Albany, cast iron sinks, Dip.

John Goodman, DeFriestville, Rensselaer county, is reported to have had on exhibition a composition for destroying insects on, and for renovating trees. A very valuable compound if it will but accomplish half what it promises; but the committee were unable to find Mr. Goodman or his compound.

H. DeGraw, Troy, case of boot jacks, and knife and fork scourers, ... V. T.

One could almost afford to wear tight boots that he might enjoy the luxury of having them removed by one of these fancy jacks. We commend the knife and fork scourer to thrifty housekeepers.

Weed, Parsons & Co., Albany, Hoe's printing press, S. M.

This press was in operation, and the bills thrown off and distributed to

the million, were perfect specimens of the art. The press is too well known to need comment from us—"it works as though instinct with life."

John Denmead, Albany, silk and woolen fringes,..... Dip.

E. A. Billings, Troy, slate enameled mantels and table tops,.....S. M.

These specimens were indeed beautiful, very highly finished and perfect imitations of marble. They are manufactured from slatestone, and said to be fully equal to marble in durability, and less susceptible to injury by defacing, or otherwise.

S. W. Gibbs & Son, Albany, three stove patterns,.....S. S. M.

K. Johnston, Cohoes, three pieces of printing cloth,..... Dip.

Knox & Hoard, (New York Lock Co.,) Knox Corners, Oneida county,

Hoard & Spencer's burglar proof lock,.....S. M.

This lock is manufactured by the New York Lock Co., at Knox Corners, in great variety and quantity, to suit all doors, from the bank vault to the common dwelling, and are what they profess to be, absolutely burglar proof. Of course it would be impossible in this place to give a detailed description, but we will mention that one of its peculiarities is, that when locked on the inside, the key hole upon the outside is entirely closed up; and further, the key acts as a stop to the bolt. So that could the bolt by any means be got at, the key must be broken before it can be moved. We consider the lock eminently worthy the consideration of the public.

Benjamin Payne, Albany, tobacco, snuff, cigars, chocolate, cocoa and pipes, a very creditable display, and many of the articles of superior merit, we award a..... Dip. & S. M.

C. V. Queen, Peekskill, blacksmith's forge,..... Dip.

Ross & Crocker, Albany, black walnut, pine, and white wood lumber, superior quality,..... Dip.

Wolcott & Webster, Chester Factories, Mass., fishing rod,.....S. S. M.

H. A. Roe, Madison, Lake Co., Ohio, Roe's Western rescue cheese vat and heater, an excellent article,..... Dip.

Henry C. Wilkins, Albany, Wilkins popped corn,..... Dip.

Supposed to be a superior article, but as the proof of the superiority of popped corn, like that of pudding, is in the eating, which test we had not the opportunity to apply, we can only speak of appearances, which were very much in its favor.

D. Harris, Albany, paper hangings and window shades,..... Dip.

J. L. Allen, Albany, meat masticator,.....V. T.

Gordon & Ballou, Albany, drapery, tassels and loops,..... Dip.

Mrs. John McDuffie, Albany, specimens of dyeing and scouring,...Thomas.

G.&S. Robinson, Albany, chandeliers for gas, and paper shades for lamps, Dip.

David Munson, Indianapolis, Ind., lightning rods,..... Dip.

W. H. Tower, New York city, compound cough cream and cholera cordial,.....S. M.

The committee cheerfully recommend the cough cream, having tested it, and find it of a very soothing character, especially to those afflicted with bronchial affections.

Amos Briggs, Troy, an article of ingenuity made by a boy.

This article was a bottle with a wooden ball inside nearly the diameter of the bottle. It was nothing wonderful for a bottle to contain a ball, but the question was how it came in there. This problem we had not time to solve but concluded to award this embryo Fulton, Thomas' Farm Implements for his ingenuity, trusting that in future he will direct his efforts to the construction of articles of utility.

O. W. Seely, Albany, machine-made horse shoes, S. S. M.

Mrs. Catharine Johnson, New York city, soap and blueing, Thomas.

J. W. Osborn, Albany, marbleized slate mantels, table tops, coffins, &c.

These articles are of the same material and construction as those exhibited by E. Billings of Troy. The display was larger and the work exceedingly well done, but the committee were of the opinion that the Troy manufacturer had excelled in design and finish. We award, Dip.

P. B. Bristol, Dansville, Livingston county, burglar's alarm.

A very ingenious and useful instrument for travelers and others, except burglars, who may not only be alarmed but killed even, for it is capable of being loaded, and can be so arranged that when the door is opened it deposits a leaden bullet in the breast of the intruder. We would advise all travelers to supply themselves without fail. It is effective and cheap, and can be carried without the least inconvenience in the vest pocket. We award, S. S. M.

Mrs. H. L. Emery, Albany, shell box, Thomas.

John Henderson, Horseheads, Chemung county, specimen of patent horse shoes, Dip.

John Henderson, Horseheads, Chemung county, patent hub and axle fastener, S. S. M.

C. Van Benthuyzen, Albany, Adams printing press and Ruggles press, also type machine and folding machine, S. M.

B. Clapper, Castleton, model bee hive, Dip.

T. C. Taylor, Philadelphia, Pa., soft and hard soap made from wheat bran, Dip.

Mr. Taylor claims to have discovered a process for making soft and hard soap from wheat bran, which he assures us is much better and cheaper than soap made in the usual way, which are certainly important considerations. We should perhaps add, that this soap will wash well in soft or hard water, or even in sea water.

Bristol, Bowne & Co., Gouverneur, carriage shafts made by machinery, S. M.

G. Jenkins, Queensbury, buggy and cart hubs, Dip.

J. P. Wilson, Ilion, Herkimer county, burglar's alarm, Dip.

This is on the same principle as the one above, of Mr. Bristol, but different in construction. The committee could scarcely choose between them.

J. H. R. Priest, New York city, tailor's shears.

Splendid article and will cut well with but slight assistance from the operator. We award, V. T.

Smart Bros., straw board,.....S. S. M.

Said by experts to be a very superior article.

Isaac Van Newhouse, (14 years of age,) Albany, case small saws, S. S. M.

Ezra Pollard, Albany, "Empire" wash tub,V. T.

An Amateur, Albany, oil painting, (for exhibition only,) very great merit.

George Jackson, Cohoes, knitting machine, superior article,.....Dip.

G. L. WILLARD, Queens county, *Chairman*.

JAMES WILLETS, Queens county,

RALPH RICHARDS, Washington county,

H. L. DAY, Greene county,

Committee.

S. A. BUNCE, Oneida county, *Secretary of Committee.*

FIRE ENGINES.

Class 7, Com. 72 E.

Daniel D. Tompkins Engine Co., No. 8, Albany, 1st premium,.....

Dip. and S. M.

Americus Engine Co., No. 13, Albany, 2d premium, ...Dip. and S. S. M.

Neptune Engine Co., No. 10, Albany, 3d premium,Dip.

Relief Engine Co., No. 11, Albany, 4th premium,.....S. S. M.

HOSE CARRIAGES.

Putnam Hose Co., No. 3, Albany, 1st premium,.....Dip. and S. M.

Washington Hose Co., No. 2, Albany, 2d premium,S. M.

Phoenix Hose Co., No. 4, Albany, 3d premium,.....S. S. M.

Gen. Wool Hose Co., Troy, (exhibition only),Equal to the best.

Hubbell & Johnson, Albany, hose spider, different class from those
awarded premiums; superior workmanship and design, as well as
convenient for handling, and for this the committee award,....S. S. M.

SAFES.

Class 7, Committee 72 F.

J. M. B. Davidson, Albany, best burglar and fire proof safe,.....S. M.

do do best parlor safe,S. M.

Winne & Abeel, Albany, "Lillie's safe,".....Dip.

Two reports having been made on safes—one by a special Committee,
72 F, to whom all the safes entered were referred, and another by Committee
65, on whose printed list safes were mentioned, but no entries made on the
entry books of the Society to Committee 65.

The parties representing Herring's and Lillie's safes were heard before
the Committee—and having heard the statements of the parties present,

On motion of Mr. E. G. FAILE,

Resolved, That the Report of the Committee on Safes, 72 F, is sustained,
The above resolution passed.

The awards are as above: the Committee recommend "*A Silver Medal*"
to J. M. B. Davidson, for the best burglar and fire proof safe, and also for
[AG. TRANS.]

the best parlor safe. To Winne & Abeel a *Diploma* for the "Lillie's" Patent Safe.

On motion of Mr. WAINWRIGHT,

Resolved, That so much of the Report of Committee No. 65, as relates to safes, be stricken out, as the articles had been referred to another Committee, 72 F, appointed for the purpose, and passed upon by them.

CLASS VIII.

No. 73. PROFESSIONAL LIST.

Cut Flowers.

For the best display, John Wilson, Albany, \$10
2d best, Smith & Hanchett, Syracuse, S. M.

Dahlias.

Best collection, John Wilson, Albany, \$6
2d best, Smith & Hanchett, Syracuse, 3
Best 24 dissimilar blooms (with names) Smith & Hanchett, Syracuse. 5
2d best, John Wilson, Albany, 3
Best 12 dissimilar blooms, John Wilson, Albany, 3
2d best, John Dingwall, Albany, 1
Best American seedling, not before exhibited, Smith & Hanchett, Syracuse, S. S. M.

Roses.

For the greatest number of newest and best varieties, Smith & Hanchett, Syracuse, \$8
2d best, L. Menand, Watervliet, 3
For the newest and best 24 distinct varieties, (with names,) Smith & Hanchett, Syracuse, 5
For the newest and best 12 varieties, Smith & Hanchett, Syracuse, . . 3

Phloxes.

For the greatest number, newest and best varieties, John Wilson, Albany, 5
2d best, Smith & Hanchett, Syracuse, 3
For the best 12 varieties, with names, Smith & Hanchett, Syracuse, . 3
For the best new seedling, not before exhibited, Smith & Hanchett, Syracuse, 1

Carnations.

For the best display, monthly carnations, John Wilson, Albany, . . . 3

Verbenas.

For the greatest number of newest and best varieties, John Dingwall, Albany, 5
2d best, Smith & Hanchett, Syracuse, 3
Newest and best 12 varieties, Smith & Hanchett, Syracuse, 3
2d best, John Wilson, Albany, 1

Best collection, 3 varieties of American seedlings, not before exhibited, John Dingwall, Albany,.....S. M.

German Asters.

Best collection, John Dingwall, Albany, \$3
2d best, Smith & Hanchett, Syracuse, 1

Pansies.

Best collection, Smith & Hanchett, Syracuse, 3
2d best, Wm. Newcomb, Johnsonville,..... 1

Ten Week Stock.

Best collection, Smith & Hanchett, Syracuse,..... 3

Discretionary.

Wm. Newcomb, Johnsonville, display of cut flowers, Dip. and Barry.
B. K. Bliss, Springfield, Mass., collection of dahlias,.....S. M.

NO. 74. AMATEUR LIST.

Cut Flowers.

For the best display, Mrs. J. T. Van Namee, Pittstown, Rensselaer county,.....Silver Medal.

Dahlias.

For the greatest number, newest and best varieties, L. E. Smith, Mechanicville, \$5
2d best, Mrs. Emily Newcomb, Johnsonville, 3
Best 12 dissimilar blooms (with names), Mrs. H. Weir, Johnsonville, 3
2d best, Mrs. J. T. Van Namee, Pittstown, 1
Best 6 dissimilar blooms, Mrs. H. Weir, Johnsonville, 2
2d best, Mrs. J. T. Van Namee, Pittstown,..... 1

Roses.

For the greatest number of newest and best varieties, Mrs. J. T. Van Namee, Pittstown, 5
Best 12 varieties, with names, Mrs. J. T. Van Namee, Pittstown,... 3
For the best 6 varieties, with names, Mrs. J. T. Van Namee, Pittstown, 2

Carnations.

For the best display, monthly carnations, Mrs. J. T. Van Namee, Pittstown, 3

Verbena.

For the greatest number of newest and best varieties, Mrs. J. T. Van Namee, Pittstown, 5
2d best, Mrs. E. Newcomb, Johnsonville,..... 3
Best 12 distinct varieties, with names, J. Theodore Van Namee, Pittstown,..... 3
2d best, Mrs. J. T. Van Namee, Pittstown,..... 1
Best 6 varieties, J. Theodore Van Namee, Pittstown,..... 2

2d best 6 varieties, Mrs. J. T. Van Namee, Pittstown,.....	\$1
For the best seedling, not before exhibited, Mrs. J. T. Van Namee, Pittstown,	1

Phloxes.

Greatest number of newest and best varieties, Mrs. E. Newcomb, Johnsonville,	4
2d best, Mrs. J. T. Van Namee, Pittstown,.....	2
Best 6 varieties, with names, Mrs. J. T. Van Namee, Pittstown,....	2
Best seedling, not before shown, Mrs. J. T. Van Namee, Pittstown, .	1

German Asters.

Best collection, Mrs. J. T. Van Namee, Pittstown,.....	3
2d best, Mrs. E. Newcomb, Johnsonville,.....	1

Pansies.

Best collection, Mrs. J. T. Van Namee, Pittstown,.....	3
2d best, J. Theodore Van Namee, Pittstown,.....	1

Ten Week Stock.

Best display, Mrs. J. T. Van Namee, Pittstown,	3
2d best, Mrs. E. Newcomb, Johnsonville,....	1

No. 75. GENERAL LIST.

Pot Plants.

Best collection of house plants, in pots, to consist of 20 different specimens, the variety of the plants, and the manner in which they are grown, considered, L. Menand, Watervliet,	\$10
Best 10 plants, different species or varieties, L. Menand, Watervliet,	5
2d best, John Dingwall, Albany,	3

Floral Design or Ornament.

Best, David McLeod, Albany,.....	5
2d best, Mrs. J. T. Van Namee, Pittstown,.....	3

Bouquets.

Best pair hand, John Wilson, Albany,.....	5
2d best, John Dingwall, Albany,.....	3
Best pair parlor, John Dingwall, Albany,.....	5
2d best, John Wilson, Albany,.....	3
Best basket bouquet, John Wilson, Albany,.....	5
2d best, L. Menand, Watervliet,.....	3

FRUITS.

No. 76. CLASS 1. PROFESSIONAL LIST.

Apples.

Greatest number of good varieties, and best specimens correctly named, 3 of each, Ellwanger & Barry, Rochester,	\$15
2d best, Smith & Hanchett, Syracuse,.....	10
Best 20 varieties, best grown and correctly named, Smith & Hanchett, Syracuse,	10
2d best, Daniel Conger, Wolcott,	5

Best 12 varieties, correctly named, six of each, Smith & Hanchett, Syracuse,	\$5
2d best, Daniel Conger, Wolcott,	3

Pears.

Greatest number of good varieties, and best specimens correctly named, three of each, Ellwanger & Barry, Rochester,	15
2d best, Smith & Hanchett, Syracuse,	10
Best 20 varieties, best specimens, correctly named, Smith & Hanchett, Syracuse,	10
Best 12 varieties, best specimens, six of each, correctly named, Smith & Hanchett, Syracuse,	8
2d best, L. Menand, Watervliet,	5
Best 6 varieties, best specimens, correctly named, six of each, James M. Matteson, Jacksonville, Tompkins county,	5
2d best, Smith & Hanchett, Syracuse,	3

Discretionary—Apples.

John W. Bailey, Plattsburgh, 125 varieties,	Dip.
James M. Matteson, Jacksonville, 12 varieties,	V. T.
Daniel Conger, Wolcott, 3 varieties,	Downing.
W. B. Van Natten, Unionville, Albany co., golden pippins,	V. T.

Pears.

W. L. Ferris, Throg's Neck, Westchester co., 50 varieties,	Downing.
J. M. Matteson, Jacksonville, 12 varieties,	Barry.
L. Menand, Watervliet, 6 varieties,	V. T.

No. 77.

Quinces.

Best dozen, apple or orange, Nathaniel Knowlton, East Greenbush, ..	\$3
2d best, John Wilson, Albany,	2

Grapes.

Greatest number of good native varieties, best grown specimens, three bunches each, William Brookbank, Hudson,	5
2d best, W. H. Merritt, Hart's Village, Dutchess co.,	3
Best 1 variety, 6 bunches, W. H. Merritt, Hart's Village, Dutchess county,	2

Discretionary.

B. K. Bliss, Springfield, Mass., fruit and flower labels,	Dip.
Charles F. Wait, West Sand Lake, cranberry vines,	V. T.
Wm. Richardson, Albany, box strawberry plants,	Dip.
D. M. Dewey, Rochester, colored plates of fruit and flowers,	S. S. M.

No. 78.—CLASS 2.—AMATEUR LIST.

Apples.

Greatest number of good varieties, and best specimens correctly named, three of each, Sylvester Burtis, Oaks Corners, Ontario co.,	\$15
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Best twenty varieties, best grown and correctly named, Smith Cobb, Albany,	\$10
2d best do Geo. W. Ruscoe, Rock Stream, Yates co.,	5
Best 12 varieties, correctly named, six of each, N. Crittenden, Ithaca,	5
2d best do Mrs. W. M. Holmes, Greenwich,	3

Pears.

Greatest number of good varieties, and best specimens correctly named, three of each, D. T. Vail, Troy,	15
Best 20 varieties, best specimens, correctly named, H. G. Dickerson, Lyons,	10
2d best twenty varieties, &c., D. T. Vail, Troy,	5
Best 12 varieties, best specimens, six of each, correctly named, John G. White, Albany,	8
2d best do Geo. W. Ruscoe, Rock Stream,	5
Best six varieties, best specimens, correctly named, six of each, N. Crittenden, Ithaca,	5
2d best do D. T. Vail, Troy,	3

Discretionary.

Maurice E. Viele, Albany, 20 varieties of apples,	\$3
N. Crittenden, Ithaca, single variety of apples,	S. S. M.

No. 79. AMATEUR LIST.

Plums.

Greatest number of varieties, and best grown specimens, correctly named, six of each, Robt. P. Wiles, Albany, plate, value,	\$5
2d best do John G. White, Albany,	3
Best one variety, 12 specimens, George W. Ruscoe, Rock Stream, Yates co.,	2

Quinces.

Best dozen apple or orange, John G. White, Albany,	3
2d best do do W. Stevenson, do	2

Grapes.

Greatest number of good native varieties, best grown specimens, three bunches each, John G. White, Albany,	5
Best one variety, six bunches, A. B. Mack, Westport, Essex county,	2
Greatest number of varieties, and best specimen foreign grapes, grown under glass, six bunches of each, David McLeod, Albany,	10
Best one variety, three bunches, Jefferson Mayell, Greenbush,	2

Watermelons.

Greatest number of varieties, and best specimens, David McLeod, Albany,	5
Best specimen, any variety, Maurice E. Viele, Albany,	1

Muskmelons.

Best specimen, any variety,	L. A. Aspinwall, Ireland's Corners, . . .	\$1
2d best do do	Philip Myers, Bethlehem,	Trans.

Discretionary.

A. T. Van Slyck, Coxsackie, seedling quinces. The number exhibited being below that required for a premium, and being very fine, we award him a copy of,	Downing.
W. Messenger, Ireland's Corners, ever-bearing raspberry seedling, . .	V. T.

No. 80.—FOREIGN FRUIT.

Grapes.

C. H. Robinson, Cleveland, O., one seedling grape of very great promise,	\$3
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PREMIUMS AWARDED FEB., 1860.—WINTER MEETING.

Survey of the county of Onondaga, by Hon. George Geddes, examined and approved,	\$400
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FARMS, GRAIN.

1st premium, Lewis Sherrill, Greenville, Greene county,	\$50
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DAIRY FARM.

1st premium, Hiram Mills, Martinsburgh, Lewis county,	50
James Zoller, Oswegatchie, St. Lawrence Co.,	Three Vols. Trans.
Hiram Olmstead, of Walton, Delaware Co., statement of his butter dairy, showing a very large yield and profit, also an article on farming, connected with the butter dairy,	Special Premium.

DRAINING.

Best experiment, W. T. and E. Smith, Geneva, (83 acres drained,) . .	\$20
T. C. Maxwell, and Bro., Geneva, Special Premium, (30 acres), S. Medal.	

ESSAYS ON GRASSES AND MANURES.

The Committee report that the essays submitted, were interesting, but did not answer to the requirements of the society.

EXPERIMENT WITH FERTILIZERS FOR INDIAN CORN.

W. P. Ottley, Phelps, Ontario Co.,	\$50
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IRRIGATION OF LAND.

Best experiment, C. L. Kiersted, Kingston, Ulster Co.,	20
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PREPARED GRASSES AND HERBAGE.

Best, Mrs. J. T. Van Namee, Pittstown, Rensselaer Co., 97 varieties, . .	15
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GRAIN AND SEEDS.

Best, Mrs. Henry Wier, Johnsonville, Rensselaer Co., 35 varieties grain and seeds, bottled; 17 varieties in stalk,	10
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FIELD CROPS.

SPRING WHEAT.

Best, C. W. Eells, Westmoreland, 2 acres, 68 4-5 bushels, net \$77.32, . .	15
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SPRING BARLEY.

Best, Hiram Mills, Martinsburgh, 2 acres, 122 3-6 bushels, net \$58.96, \$15

RYE.

Best, C. L. Kiersted, Kingston, 8 35-100 acres, 302 bushels, net \$158.87, 15

OATS.

Best, C. L. Kiersted, Kingston, two acres, 213 bushels, net \$97.72, ... 15

2d, Wm. H. Slingerland, Normanskill, Albany Co., 6½ acres, 618½ bushels, net \$236.28, 10

FLAX.

Best, Merrit C. Snyder, Rensselaer Co., 2 18-100 acres, net \$146.97, 15

2d, Henry Wier, Rensselaer Co., 1 74-100 acres, net \$82.85, 10

BUCKWHEAT.

C. L. Kiersted, Kingston, 1 acre, 35½ bushels, net \$11.18, 8

Mr. A. Gurnee, Watertown, presented a statement of an oat crop raised by him on one acre of ground—your Committee would recommend a Volume Transactions, Mr. G. not being entitled to a third premium, having failed to conform to the requirements of the society as to the number of acres.

Your Committee regret that no crops of winter wheat were presented for premiums, the crops of grain having been unusually fine the past season, and they have no doubt that some statements might have been made of crops, which would have tended to restore the confidence of farmers in this crop, which for the past few years, owing to the ravages of the wheat midge, has been rapidly failing.

PEAS.

Best, E. W. Bushnell, Hillsdale, Col. Co., 1½ acres, 40½ bushels, net \$50.40, \$8

2d, John Potter, Marcy, Oneida Co., 1 acre and 2 rods, net \$36.78, 5

3d, Ira R. Peck, East Bloomfield, 1 1-100 acres, 40 bushels, net \$18.50, Trans.

POTATOES.

Best, E. S. Hayward, Rochester, 1 acre, 305 bushels, net \$83.03, ... \$3

RUTA BAGAS.

Best, Hiram Olmstead, Walton Delaware Co., 82 rods, 807 bushels, net \$126.10, 8

CARROTS.

Best, E. S. Hayward, Rochester, 47-100 acres, 303 bushels, net \$42.10, 8

2d, Hiram Olmstead, Walton, 42 rods, 277 bushels, net \$46.45, ... 5

3d, A. Gurnee, Watertown, 1-5 acre, 195 bushels, net \$31.15, Trans.

DISCRETIONARY.

GRASS CROPS.

C. L. Kiersted, Kingston, Ulster Co., 1 acre, net \$51.44, Trans.

GRAIN AND SEEDS.

One bushel of each the amount exhibited.

WINTER WHEAT.

Best bushel, Oliver J. Tillson, New Paltz, Ulster Co., (60 lbs.),.... \$3

SPRING WHEAT.

Best, C. W. Eells, Westmoreland, Oneida Co., (63 lbs.), 3

2d, W. P. Coonradt, Brunswick, Rensselaer Co., (62 lbs.),..... 2

3d, A. E. Van Allen, East Greenbush, Rensselaer Co., (62 lbs.),.... 1

RYE.

Best, O. J. Tillson, New Paltz, Ulster Co., (59 lbs.), 3

2d, E. W. Bushnell, Hillsdale, Columbia Co., (58 lbs.), 2

3d, W. P. Coonradt, Brunswick, Rensselaer Co., (56 lbs.),..... 1

BARLEY—TWO ROWED.

Best, Hiram Mills, Martinsburgh, Lewis Co., (50 lbs.), 3

2d, Norman Gowdy, Lowville, Lewis Co., (49 lbs.),..... 2

OATS.

Best, C. W. Eells, Westmoreland, Oneida county, "Scotch oats,"
(42 lbs.)..... \$32d best, Geo. Cary, Bethlehem, Albany county, "Barley oats,"
(42 lbs.) 23d best, Henry Wier, Johnsonville, Rensselaer county, "Poland oats,"
(40 lbs.)..... 1Although the Poland oat has a very hard shell, yet, when crushed
or ground, is superior to the common oat for feeding.

YELLOW CORN.

Best, E. S. Elting, New Paltz, Ulster county, (61 lbs.) \$3

2d best, Wm. Newcomb, Johnsonville, Rens. county, (60 lbs.) 2

3d best, W. P. Coonradt, Brunswick, Rensselaer county, (61 lbs.)
quality inferior,..... 1

WHITE CORN.

Best, Henry Wier, Johnsonville, Rensselaer county, (58 lbs.)... .. 3

PEAS.

Best, Henry Smith, Lowville, Lewis county, (62 lbs.) 3

2d best, Norman Gowdy, Lowville, Lewis county, (61 lbs.)..... 2

3d best, E. W. Bushnell, Hillsdale, Columbia county, (62 lbs.)..... 1

WHITE BEANS.

Best, W. P. Coonradt, Brunswick, Rensselaer county, (64 lbs.) 3

2d best, O. Howland, Auburn, Cayuga county, (63 lbs.)..... 2

3d best, Henry Wier, Johnsonville, Rensselaer county, (61 lbs.).... 1

Some fine grass seed was exhibited by Mr. Samuel Cary, of Albany, consisting of large and small clover and timothy seed; but as there was no certificate accompanying the same, the judges could not award any premium.

FLAX SEED.

Best, Henry Wier, Johnsonville, Rensselaer county, "Red Flax," (53 lbs.).....	\$3
2d best, Henry Wier, Johnsonville, Rens. county, "White Flax," (52 lbs.)	2
3d best, Wm. Newcomb, Johnsonville, Rensselaer county, "White Flax," (50 lbs.)	1

BUCKWHEAT.

Best, O. J. Tilson, New Paltz, Ulster county, (52 lbs.).....	3
2d best, W. P. Coonradt, Brunswick, Rens. county, (52 lbs.).....	2
3d best, A. E. Van Allen, East Greenbush, Rens. county, (51 lbs.)..	1

Discretionary.

E. S. Elting, New Paltz, Ulster county, Rhode Island, premium corn, in ear,.....	S. S. M.
D. W. C. De Forest, De Freestville, Rensselaer county, superior sample yellow corn, in the ear,.....	Trans.
W. P. Ottley, Phelps, Ontario county, best sample eight-rowed yellow corn,	Trans.
W. P. Coonradt, Brunswick, Rens. county, sweet corn, (49 lbs.)..	Trans.

POTATOES.

Samuel Cheever, Waterford, exhibited 26 varieties potatoes, raised from seed furnished by Rev. C. E. Goodrich, Utica. The fifth year from planting, some appear to be of excellent quality. A special premium is recommended,.....	S. S. M.
C. E. Goodrich, of Utica. a very interesting statement of his potato experiments,.....	Special Premium of \$100 awarded.
George Holtzman, gardener, Rome, nine varieties potatoes,.....	Trans.
W. P. Ottley, Phelps, Ontario county, specimen Chilian potatoes,	Trans.
D. A. Bulkeley, Williamstown, Mass., early and late varieties potatoes,	Trans.
A. Gurnee, Watertown, Jefferson county, sample carrots,.....	Trans.

BUTTER.

Best three tubs, Elisha Crofoot, Turin, Lewis county,.....	\$15
2d do Mrs. Hiram Mills, Martinsburgh, Lewis county,....	10
3d do F. B. Rugg, Leyden, Lewis county,.....	5
4th do Mrs. P. Lathey, Phelps, Ontario county,.....	Trans.
Best three tubs made in June, August. and November, F. B. Rugg, Leyden, Lewis county,	\$15
2d do Elisha Crofoot, Turin, Lewis county,.....	10
3d do L. L. French, Warren, Herkimer county,.....	Trans.

WINTER BUTTER.

Best sample, R. H. Wands, College Farm, Ovid, Seneca county,....	\$5
2d do Sandford Coe, Constableville, Lewis county,.....	3
3d do N. Gowdy, Lowville, Lewis county,.....	Trans.

Discretionary.

To Mr. Havilla Winchell, Morehouse, for the first specimen of butter from Hamilton county, a very creditable sample, . . . Vol. Trans. and \$1
Miss Jane E. Mills, Martinsburgh, Lewis county, handsome specimen of butter; . . . Silver Spoons.

CHEESE.

Best three cheese, Norman Gowdy, Lowville, Lewis county, . . . \$15
2d do E. F. Carter, Le Ray, Jefferson county, . . . 10
3d do Hiram Mills, Martinsburg, Lewis county, . . . 5
4th do Theron Van Auken, Phelps, Ontario county, . . Trans.

Discretionary.

R. H. Wands, N. Y. Ag. College Farm, Ovid, keg lard, . . . \$5

FRUITS.

APPLES.

Best twenty varieties, Ellwanger & Barry, Rochester, . . . Dip. and \$4
Best sixteen varieties, William H. Slingerland, Normanskill, Dip. and \$3
2d best do Wm. P. Ottley, Phelps, Ontario Co., Barry and \$1
Best dish, D. W. C. De Forest, De Friestville, Rensselaer county, "Newtown Pippin," . . . S. S. M.
2d best dish, Cornelius Chase, Chatham, Columbia county, "Esopus Spitzenburgh," . . . Trans.

PEARS.

Best collection, 40 varieties, Ellwanger & Barry, Rochester, Dip. and S.M.
Best two varieties, Elisha Dorr, Albany, . . . S. S. M.
Best two varieties grapes, "Isabella and Catawba," R. P. Wiles, Albany, . . . Thomas.

Discretionary.

Thomas Evans, Watkins, Schuyler county, "Fruit Picker," ingeniously constructed and admirably adapted to the purpose, . . . S. S. M.

WINES.

O. F. Presbrey, Buffalo, "Isabella," very fine article, . . . Downing.
Best currant wine, a good and beautiful article, prepared from white grape currants, Ellwanger and Barry, Rochester, . . . Downing.
Best Elderberry wine, good article, A. F. Chatfield, Albany, . . Downing.
Cider, bottled, fine article, O. Howland, Auburn, . . . Thomas.
Cider, bottled, treated with sulphate of lime.
Maple molasses, beautiful article, Hiram Mills, Martinsburgh, . . Trans.
Strawberries, currants and cherries, preserved, Phillp Myers, Bethlehem, . . . Thomas.

MISCELLANEOUS.

T. A. Jebb, Buffalo, Jebb's Patent Telegraph Churn, . . . Diploma.
See ante report, 188.

Wm. Richardson, Albany, fat hog, 529 lbs.,	S. M.
W. P. Ottley, Phelps, Ontario Co., very fine poultry,	S. S. M
O. Howland, Auburn, poultry,	Trans.
Walter A. Wood, Hoosic Falls, Rensselaer Co., model of Wood's patent mower,	Favorable notice.
S. E. & M. P. Jackson, Boonville, Oneida Co., model of mowing machine, with improvement on side draft,	Favorable notice.
H. C. White, Buffalo, for Wilson's Soluble Bone Manure, ..	Favorable notice.
T. K. Van Zandt, Albany, painting of bull "Neptune," owned by Hurst, Bullock & Slingerland,	Dip.

GAME LAWS

PASSED AT THE LAST SESSION OF THE LEGISLATURE.

Chap. 223.

AN ACT for the preservation of birds and small game upon and around the shores of Luzerne lake.

Passed April 10, 1860; three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. No person shall kill or shoot any game or birds upon the waters of Luzerne lake, in the town of Luzerne, and county of Warren, or upon the shores thereof, nor shall any person fire any gun or pistol upon the said lake, or upon the shores or lands within twenty-five rods of the same.

§ 2. Whoever shall offend against the provisions of this act, shall, for each offense, forfeit the sum of ten dollars.

§ 3. All penalties imposed by this act may be sued for and recovered with the costs of such suit, before any justice of the peace of the county of Warren, by or in the name of any person making complaint thereof, or by one of the overseers of the poor of the town where such offense shall be committed; and if sued for in the name of any such overseer, the penalty, when collected, shall be paid, one-half to the complainant and one-half to the overseer, for the use of the poor of the town. If sued in the name of the complainant, he shall give satisfactory security, at the time of the commencement of the action, for the payment of all costs in the event of failure to recover, and judgment therefor, when recovered, shall belong to and be payable to said complainant.

§ 4. The provisions of section one hundred and forty-three, of title four, chapter two, part third, of the Revised Statutes, shall be applicable to any offense committed against the provisions of this act.

§ 5. This act shall take effect immediately.

Chap. 384.

AN ACT for the preservation of moose, wild deer, birds and fish.

Passed April 14, 1860; three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. No person or persons shall kill, or pursue with intent to kill, any moose, wild deer or fawn during the months of January, February,

March, April, May, June and July, or shall expose to sale or have in his or her possession any green deer skin or fresh venison at any time during the months of February, after the fifteenth day thereof, March, April, May, June and July, under a fine of twenty-five dollars for each deer so killed, and for each green deer or fawn skin or fresh venison so exposed for sale or had in his possession.

§ 2. No person or persons shall kill, or have in his or her possession, or expose for sale within the State of New York, any woodcock between the first day of January and the fourth day of July in each year, or any partridge or ruffed grouse between the fifteenth day of January and the first day of September, or any quail (sometimes called Virginia partridge) between the first day of January and the fifteenth day of October, or any wood, black or teal duck between the first day of February and the first day of August in each year, under the fine of two dollars for each and every of said birds so killed or had in possession.

§ 3. No person or persons shall kill any prairie fowl or pinnated grouse in the State of New York within five years from the passage of this act, under a fine of ten dollars for each bird so killed.

§ 4. No person or persons shall at any time within this State, catch any quail (sometimes called Virginia partridge) or ruffed grouse, with any trap or snare, under a fine of two dollars for each bird so caught.

§ 5. No person or persons shall at any time within this State, kill, cage or trap any nightingale, nighthawk, blue bird, yellow bird, Baltimore oriole, finch, thrush, lark, sparrow, wren, martin, swallow, or any bird of the species of woodpecker or other harmless bird; nor shall any person or persons kill, cage or trap any bobolink or robin between the first day of February and the first day of October in each year, under a fine of fifty cents for each bird so killed, caged or trapped.

§ 6. No person or persons shall, with intent so to do, catch or have in his or her possession, or expose for sale within the State of New York, any speckled brook trout or speckled river trout or lake trout between the first day of September and the first day of March, or any salmon trout or any muscalonge, between the first day of December and the first day of April in each and every year, under a fine of five dollars for each fish so taken or had in possession.

§ 7. No person or persons shall take any salmon trout, save in the waters of Lake Erie and Lake Ontario, or any speckled brook trout, or speckled river trout, or lake trout or muscalonge, in any of the waters of this State, at any time, save with a hook and line, under a fine of two dollars for each fish so taken; but this section shall not apply to any persons who shall prove the same was accidentally done, in the pursuit of a lawful fishery for other fish.

§ 8. No person or persons shall take any fish in any of the fresh water streams, bays or lakes in the State of New York, with any kind of net or in any other manner, during the months of December, January and February, nor at any time with a net, seine or pike, in that part of the

Croton river, in Westchester county, lying between the track of the Hudson River railroad and the dam of the first wire factory above, nor in any part of the waters of Lake Na-tan-water (or Fish lake) in the town of Granby in the county of Oswego, nor shall so take at any time any muscalonge, pickerel or pike from the Seneca river, the Canandaigua or Clyde river, under a fine of twenty dollars for each offense; but this section shall not apply to any other of the tide waters of this State, nor affect section seven of this act, nor the right to catch suckers.

§ 9. All fines imposed under the provisions of this act, may be recovered with the costs of suit, before any justice of the peace in this State; and said fine, when collected, shall be paid one-half to the person making the complaint, and one-half to the overseer of the poor for the use of the poor of the town in which conviction is had; and on non-payment thereof, the defendant shall be committed to the common jail of the county for the period of not less than five days, and at the rate of one day for each dollar of the amount of the said fine and costs, in addition thereto, when the same is over the amount of five dollars.

§ 10. Any person proving that the birds, fish, skins or animals found in his or her possession during the prohibited periods, were killed prior to the prohibited periods, or in any place outside of the limits of this State, shall be exempted from the penalties of this act.

§ 11. In all prosecutions under this act, it shall be competent for common carriers or express companies to show that the inhibited article in his or their possession came into such possession beyond the limits of the State, and such showing shall be sufficient defense in such prosecution.

§ 12. Any person who shall enter the lands or premises of any resident of this State, with any fire-arms or other implements for the purpose of hunting or fishing, contrary to the provisions of this act, shall be deemed guilty of a trespass, and shall, upon conviction before any justice of the peace, forfeit and pay for the use of the poor of the county in which such conviction shall be had, the sum of five dollars in addition to the provisions of this act.

§ 13. Any person who shall at any time enter upon any field in which cultivated trees, plants, vines, or crops are growing, or into any garden, with any fire-arms or other implements for the purpose of hunting without the consent of the owner or occupant thereof being previously had and obtained, shall be deemed guilty of trespass, and upon conviction thereof shall pay a fine of ten dollars for the use of the poor of the county in which conviction is had.

§ 14. Nothing contained in this act shall apply to the waters of Lake Erie, Lake Ontario and Champlain, and the rivers of St. Lawrence and Niagara, and the bays thereof, nor to Cayuga or Seneca lake.

§ 15. Chapter five hundred and eleven of the laws of eighteen hundred and fifty-nine, and all other laws inconsistent with the provisions of this act, are hereby repealed.

§ 16. This act shall take effect on the fifteenth day of May next.

ADDRESS OF HON. JOHN THOMPSON,

BEFORE THE DUTCHESS COUNTY AGRICULTURAL SOCIETY.

Mr. President, Ladies and Gentlemen:—

Nothing that respects the interests of agriculture is of slight or trifling consequence, lying as it does at the basis of national prosperity, holding the prime elements that give us comfort and sustenance in its hand, and furnishing the material which the earth, like a mother, gives off from her affluent bosom to feed and clothe her children. The great problem for agricultural science to solve is, how to reach the maximum of production with the minimum of toil, and this covers the whole field, and embraces the entire economy of labor—how to enrich small surfaces so as to condense upon them the fruitfulness of wider areas,—and this embraces the difficult questions of capital and population; the first ever growing in consequence, and the last as constantly diminishing; for as a dense population needs bread, commerce unfurls her sail or gets up her steam, by land or sea, and brings it, so that the distribution of population over given areas now ceases to perplex the brains of political economists, and centers may be made anywhere, their circumference being everywhere.

In the order of Providence, the *results* of agriculture are surer than those of commercial enterprise, or of mechanical or manufacturing skill. What vast and expensive outlays of the latter that result only in ruin? A panic seizes upon trade, and the wing of commerce droops and the hull rots in the harbor; a revulsion, for any cause, comes over the land, and the hum of the factory ceases, the shop is closed, and the operatives or mechanics are found dotting their little cabins on the western prairie, where their peculiar skill and education are valueless in their struggles with the soil. But agriculture is subjected to no such rules of derangement. She prays, with Christian faith, "Give us this day our daily bread," and receives it. The seasons fail not in their mutations, or in the affluence they scatter from their full horn. Year by year, with unbroken regularity, the seed germinates in the furrow, the corn waves in the valley, flocks and folds feed upon the hills, and seed time and harvest fail not. There may be partial and local interruptions of this general law—one tuber may fail with the rot—one cereal may be devoured by the fly or destroyed by the rust—a district may parch under the drought or be deluged by the flood, but the grand result is unaffected. The wisdom of God provides that a nice law of compensation runs through the operations

of nature, so that the earth, as a whole, never has more mouths than she has bread to put in them—never more population than she has clothes to give them; and if some are hungry and others naked, it is by the blunders of humanity, and not by any stinted supply from the Divine Benefactor. And here let me remind you that no pursuit is so directly dependent upon the divine favor. The mechanician trusts to his skill and craft to complete his project. The physician, lawyer, trader, to his own accomplishments for success; but the farmer is a partner and co-operator with the Eternal Worker! He plows and sows and prunes and waters, and so his task is done. A divine agency takes up the thread where he leaves it, and elaborates in its mysterious loom those fabrics of usefulness and beauty that feed our tastes and satisfy our necessities—weaving night and day, out of the muck and out of the mist, out of the shade and out of the sun-beam, out of the water and out of the air, out of the gravel and out of the gas—feeding the organic with the inorganic—transmuting soil into sap, earth and moisture into the fine tracery of the leaf, or the delicate pencilings of the flower. Thus man walks with God in the field and in the garden, and takes his nourishment directly from his hand. With what prolific fecundity the earth gives up her treasures! How incessantly she works! Motion, her eternal law; works by snow and frost, by light and heat, in summer and winter, evolving gasses and reabsorbing them, through life and death, decomposition and assimilation—to give lustre to the flower, fullness to the grain, fatness to the cattle, fleetness to the horse, balminess to the air, and clearness to the sunshine; and all this for man! And then, also, lying all over her surface, or cropping out from her rifted hills, or upheaved from the depths with the shivered shafts of her broken ribs, are the minerals and metals for the arts, and coal in its black store-houses, packed away hard by, to fuse them into forms of usefulness and ornament, awaiting only the touch of the human artificer to cause them to spring forth. What a superb dwelling place! lighted up by day and night—where *complainers* are *atheists*, and *ignorance* *insanity*—an immense granary, forever replenishing; a superb workshop, perpetually in motion, not a wheel broken, not a wing drooping, not a whisper silent!

What an *honorable* part do the practical cultivators of the soil perform? They are not drones in the social hive; they disdain to live on the toil of others, aspire to the dignity of an independent manhood, and stand up in the face of heaven and earth with the stamp of individualism on their brow. The snobism that affects a gentility and refinement to trade, and sets a higher appreciation on the mere porterage that effects an exchange between the producing and consuming classes, is as unwise as it is contemptible. No class in society ranks higher than the producing class. They are as springs in the desert out of whose prolific depths are drawn the refreshments and supports of life.

I need not contrast country and city life, or allude to their effects on health and character. Swill milk for children, and gambling hells for men

and boys, foul air and reeking dens, crazy tenements and starving occupants, all the luxury and license of Pandemonium in one dwelling, and all the pinching horrors of hunger and madness in another, rank hotbeds of vice and crime! Who would live in a crowded city, or fill the ranks of its wasting population with the new life blood of a country supply, except by constraint? for a great object, where the magnitude of the prize justifies, to some extent, the hazards of the venture?

I know our cities, with their artificial wants and woes, give rise to great virtues, splendid charities, large benevolences; but all these come as cures to the evils of a crowded population. Man, in city life, is like a tree in a dense forest; he may run up to a great height in wealth and influence, but his root is weak, and he has more top and show than strength of limb; and when he is left alone he is in peril from the first blast that assails him. The man that develops in his rural home, learns to depend upon himself; to rely upon his individuality. He builds up his mind with sterner moral forces, and sends out his roots with a longer reach and a tougher hold. He stands, in fine, like one of our splendid maples or oaks, in the center of the field; towering, grand, symmetrical; guarded on all sides against assailment, its leaves toying with the zephyr, and its strong limbs defying the tempest and the storm!

Nothing could be more fruitful of benefit to us than a review of the progress of agricultural science and art for the past fifty years. Our personal experiences would stretch over more than half the period. It is difficult to realize what strides have been taken in this department since the Indian wigwam sent up its smoke from this plain, and the unbroken forest waved on these hillsides. What a world of trial lies buried on the surface of these smiling meadows since the first axe was buried to the eye in their primeval crop! How slowly the clearing crept upon the forest even with the agencies of steel and fire. Our western settlers now have little of this to meet and master. When the land was cleared and fenced with great labor, think of the *habitation* in which the farmer lived, and the *road* over which he traveled. It is a curious fact that historians usually ignore or pass over in their annals the *actual condition* of a people, and we feel that after wading through huge volumes we know about nothing respecting their social and physical condition. Hence Macaulay charms us more than all others, by the minuteness of his details, and the accuracy of his home pictures of English life.

As you have rolled along a smooth highway, from your several homes to this pleasant place of resort, in your vehicles that almost lull you to sleep with their gentle motion, think of the deep miry sloughs through which your grandsires floundered all day, where you have not spent an hour! As you ride up a hard, gravelly walk to your tasteful homes, buried in trees and shrubbery; your parlors decorated with all the elegancies of Wilton and Brussels, of luxurious lounges and superb mirrors; think of the inconvenient old tenement down by the brookside, into which you hardly feel you could turn a horse on a rainy day; or perchance its former site, marked

only by a heap of stones, tumbled into the cellar, where abode the pioneers, whose endurance and toil we are reaping. Country roads, not to speak of railroads; country homes, not to speak of palaces; and country vehicles, not to speak of coaches, all indicate that title of progress, comfort, and taste, which it is hardly possible for one to realize, contrasted with even thirty years ago; they are the gentle footsteps of civilization and refinement.

How little care was bestowed upon *stock*; a farmer bought such cattle or horses as he could conveniently procure; he was too busy clearing his land to pay much attention to the stock he put on it. *Horses!* all points and no points, condemned to heavy and incessant work, and no fine roads for speed or bottom. *Oxen!* heavy jointed, crooked backed, one horn up and another down, to pull a plow through stones and stumps. *Cows* that could leap like a deer, and seek their own pasturage with a bell on the leader's neck. *Pigs!* all legs and snout, wild and running in the woods. *Sheep* few and poor. The *dog* only, of the domestic family, flourished, for game was abundant, and he was a friend and protector in a new country. As to the farmers' selection of *seeds*, there was no choice; he sowed of his own raising, or exchanged with his neighbors, and Goodrich, in his "Recollections," tells of a farmer going forty miles on horseback for a peck of corn.

What were the *products* of the farm? Grass, corn, potatoes, rye, oats, turnips. Where was the grass procured? On a piece of swamp or "natural meadow," as it was called, and of a quality corresponding—coarse, wiry, and sour; you would hardly bed your cattle with it now. Could stock thrive on such keeping, in such winters, and with the slight protection they had? impossible. The newness of the soil, and the amount of ashes left by the burning forests, for a long time gave it strength and luxuriance; it was the paradise of weeds, and appropriate implements were not at hand to exterminate them; a heavy, clumsy *hoe*, made by the blacksmith; *forks* of the same character; a *bull-plow*, which required the mounting of a boy with it every Monday morning, to get it sharpened; the old *scythe* and *cradle*—curiosities! Do you remember the excitement made by the new cradle, with its long, smooth, taper fingers, light and strong? by the new *hand rake*, with its light, tough head, and round, smooth teeth? by the *cast steel fork*, so slender and ringing that the old men shook their heads, and feared it would fly to pieces like glass! What a marvel it was when farmers began to sow grass seed on upland, and gather the crops with a horse rake! how the marvel increased when the rake had teeth behind, as well as before, and rolled over when full! What a world of speculation was witnessed over those crooked, steam-twisted scythe snaths, with smooth turned knibs, and a ring and heel that laid the blade close to the earth without stooping! and again, over the sanded rifle, to give it edge and keenness; and then, when the *cast iron* plow, light and strong, turned up its saucy moldboard, and the coulter before cut the sod, which was turned upside down, as beautifully and smoothly as if by magic, the exclamation

was on every lip, "What will come next!" But the *cultivator* and *harrow* followed, and after an interval the mower, reaper, thrasher, raker, and all by horse power. The "thrasher and cleaner," so beautifully combined that immense stacks of grain deposit their golden stores in the farmers' bags in a few hours, by a sort of mechanical enchantment—you have seen it to-day! all labor-saving, and therefore money-saving instrumentalities, until the farmer can now cultivate one hundred acres with less of manual toil than he formerly expended on thirty; and for this he is mainly indebted to the inventive power and mechanical skill of his fellow citizens of the shop. Many improvements were doubtless suggested by the experience of practical agriculturists, but many more by the inventive power of those men who, with true Yankee skill, are always trying to find out some new mode of turning the least labor to the greatest account. Says Mr. Holt, the Commissioner of Patents, in his last report: "While every part of the field of invention has been assiduously occupied, that relating to agriculture has proved most fruitful. Of the 2,910 patents issued in 1857, 438 were for agricultural processes and implements. This is a most grateful feature in the year's operations, for as the virtues of Cincinnatus have ever been found, like that illustrious patriot, at the plow, so every improvement in the arts and sciences, tending to develop the strength and advance the general prosperity of the tillers of the soil, is broadening and deepening those foundations on which, alike in calm and in storm, the republic must rely for its security."

It is hardly possible to realize the improvements in all kinds of farming implements within thirty years. There are men here to-day who have used all the old cumbrous articles I have mentioned, and have almost forgotten that they ever existed! Every department increases its efficiency as it acquires increased instrumentalities to make labor lighter or apply it more skillfully. Economy is a law of nature.

I ought to notice the improvement in all *vehicles* of pleasure or use. Formerly they were a load without anything in them, corresponding in strength and weight with the roughness of the way they traveled; now the horse accelerates his speed and retains his strength while the load is decreased, because the dead weight and heavy draught is diminished. How steel springs break the jar of everything but carts—even the wheelbarrow aspires to them. Once they were so rare, and indicated such wealth and luxury, that double toll was exacted for them on the turnpike, although the wear of the road was thereby *diminished*. Look at the body of the wagon you ride in, mere gossamer work, light, airy, soft as down; the springs yielding as ether; the wheels graceful as a toy, and yet safe and strong—a type of the whole. Our economical farmers may ride in their covered carriages, without being accused of pride or extravagance.

Does it seem possible that the world has rolled along 5,800 years without a *fanning mill*, winnowing grain from chaff with a "fan," aided by the wind? I have seen these Adamic implements when a boy, a curiosity which should be preserved in our museums for the wonder of future generations.

I have spoken of the quality of our domestic animals a few years ago, in the departments of meat, milk, butter, and labor. Need I tell you what has been done? Look around you—if Arthur Young, or Bakewell, or Lord Townsend, those pioneers of stock improvement in England, could come back, what a fruition to their dreams of perfection would these specimens furnish. Though hundreds of beautiful herds gem the landscape in their ancient English homes, they will find no Durhams of finer form, more beautiful proportions or gentler temper than these; no Alderneys that give richer cream, or make more golden butter; no Devons of better blood, of compacter make or deeper color; no specimens that for yoke or stall are superior in bone, muscle, or quickness; and these superb animals are intermixed by crosses through all our own cattle, giving the promise of such a race as any country might be proud of. Some of them costing \$5,000 apiece, the pick and jewel of English herds, are brought by the enterprise and energy of one of our distinguished citizens to our doors, as if to shame the indolence and thriftlessness that can be content with anything but the best. And the like remarks would be true, had I time to make them, in respect to our swine, our sheep and our poultry. The great desideratum in stock is to produce an *early maturity* and a *tendency to flesh*, and this is done only by judicious breeding. Unless the constitutional tendencies and temper are first right, the feeding is thrown away, and will only aggravate those natural deformities that make the animals already profitless, and I am proud to say that this county possesses as fine specimens of cattle as can be found on this continent, or even in Europe.

Our horses—what shall I say for them? Perhaps our county does not raise as many fine colts as formerly, yet there is evident improvement here. Very few of our farmers but have a fine, fast, stylish single horse or span. Our hard smooth roads and our light, tasty vehicles make a beautiful, light-stepping, high mettled steed almost a necessity. It might be profitable, had we time, to inquire how far the habit of discontinuing the use of the saddle, now so prevalent, tends to weaken our attachment for, and destroy our interest in the horse. Mounted on the back of a high spirited, generous steed, the rider, in the life and exhilaration of his motion, feels almost the identity of a *human* companionship! How the Arab pets and prides himself in his barb, who, "looking as though the speed of thought were in his limbs," never wears a harness, or knows a shaft. Money cannot buy the Bedouin's mare, or part the friends that scour the desert sands together. Our better highways are not chargeable with this disuse of the saddle, for where are the highways so smooth as in England, and there what care and pride in the horse, and how universal his use with the saddle. The "horse and its rider," seems to be a phrase appropriate only to the last generation. We are becoming too effeminate for the fatigue of horseback journeys, too fashionable for equestrian rambles. Our wardrobes occupy a two story trunk, instead of the slender saddle bags our grandfathers carried; and our sisters, wives and daughters fear to be jolted,

and prefer to languish on a sofa at Saratoga and ride in the cars. This is degeneracy, not progression. What an outrage that so noble an animal as the horse should ever know abuse. In a more advanced stage, I expect to see the drudgery of the farm left to the mule, the ox, and to steam; while the horse, with his intelligence and native high bred nobility, shall be petted and cared for as man's more intimate companion, a thing of beauty, luxury and pride.

But agriculture has wider interests than those which pertain to implements and stock. Her exceeding riches lie in *prolific soils*, and in the vast varieties of vegetable life—generations of food for men and animals. This is the peculiar domain of *agricultural chemistry*. It was supposed the science would be available in almost any department before that of the farmer; science might discover and unroll the mighty mechanism of the heavens, and busy herself about such august and awful concerns without an infringement of her dignity; science might even deal with the wonders of microscopic life, and classify and arrange all the tribes of minute existences that elude the vision of the human eye, and bring no reproach upon herself. Nay, she might even name and arrange in genera and species the tree, the shrub, the flower, pointing out their properties and uses, and still remain true to her mission! But to meddle with soils and swamps—with the nature of the earth and aliments for roots—with the moisture and gasses, that bathe and beautify, branch and blossom—with mucks and manures—with solvents and absorbents,—this was to soil her fingers by vulgar contact and to discrown her royal dignity. So thought her friends; but the true science looked with a keener eye into the heart of things; here was a sea, new and untraversed as the Atlantic when Columbus crossed it; nay, even more so, for a scientific sail had not been unfurled even along its shores! Chemical science having prepared her laboratory, and settled as far as experiment enabled, her principles, turned herself to study the chemical relations of all substances concerned in agricultural production. THE GREAT MYSTERY OF VEGETATION WAS HER PROBLEM—what was the composition of plants, as well as animals; what the thousand combinations of organic and inorganic matter—of carbon, oxygen, hydrogen, and nitrogen, which belong to organic chemistry, what elaboration and secretion of those elements enter into the composition of animal and vegetable life? What formed the bone, the fat, the milk, the vigor of animals?—what the bark, the wood, the sap, the fruit, of trees and shrubs—what swelled the berry of the grain, and reddened the blushes of the flower?—What plant-food from soil or manuring would be taken up at the root, or what gases would be absorbed by the leaves to develop their properties, or add to their usefulness and beauty,—what ingredients are exhausted by tuber or cereal? and how are they to be replenished? These and a thousand other questions were soon propounded to agricultural chemistry; and under the investigation of Sir Humphrey Davy, who opened the door into the temple, and of Liebig, who penetrated into every department and threw a glory over all he touched, they were successfully answered

and agriculture was lifted at once from a drudgery into a science, from a toilsome routine into a system of nice analyses and rational results. Unlike the animal that roams abroad for its food, the plant is stationary; it holds to the soil mechanically, for support as well as nutriment, for foot hold as well as for food, and there often perishes unless its nutriment comes to it in the water it drinks with its roots, or the gases it inhales with its leaves. Hence the place of its germination became at once of the first consequence in two aspects—as to its condition and its components, its state, or *physical* properties; and its native chemical composition. Thus commenced the *Analysis of Soils* in agricultural chemistry. It was soon discovered that *sterility* did not always indicate the absence of those properties on which fertility seemed to depend, but of certain stimulants to set them in motion. Thousands of acres in England have been reclaimed and fertilized simply by a different admixture of soils, the difficulty of unproductiveness being rather physical than chemical, clay being carried upon open, porous soils, to absorb gases and retain moisture; and gravel mixed with clay to loosen its texture and make it friable and light. Innumerable tracts have been drained of their drowning moisture, and others have been irrigated by natural springs or from artificial sources. Well might the Royal Society vote a medal to Reid, the inventor of the draining tile. It was like lifting a new island as large as one-twentieth of England, out of the sea! But perhaps the greatest benefit of agricultural chemistry was in finding by analysis what peculiar property of the soil was exhausted by a specific crop, so as to introduce, not only an intelligent system of rotation, by which the earth could recover what had been lost, which also takes place in fallow; but in pointing out in the fertilizers which are appropriate, the sure method of reviving and maintaining, in exhaustless fecundity, fields subjected to constant cultivation—marl, lime, muck, manure, gypsum, salts of ammonia, bone dust, guano. “He that soweth bountifully shall reap also bountifully” is the language of nature, as well as of nature’s God. Abundant and rich fertilizers repay their cost an hundred fold. The worst economy is to starve your fields. They may not low and bellow for their food; they will not break over fences to find it, but the poverty of their production will reprove your wisdom and your pocket alike, for the niggardness of your benefactions. “High farming” in the preparation of the soil, in deep plowing and unstinted manuring, is economy and not wastefulness. Poor farming loses the yearly interest on the whole capital and actually diminishes that, whereas the contrary receives the interest and adds to the capital besides. In this country land is still too cheap, population too sparse, and labor too high to pursue very extensively an admixture of soils so as to increase their fertility by new physical combinations; and the exhaustless riches of our western openings and prairies cause our farmers there to pay but little attention to manures and stimulants. But *here* this branch of agriculture is assuming vast importance; it is to be studied and understood; we must know and practice it, if we compete at all with our western neighbors in the markets, now that their crops can move by *steam on our canals and*

reach our doors at half the cost and in half the time of former years. Steam on the rail and on the water is equalizing all portions of our country; is taking away our pre-eminence of location almost within the smoke of the great metropolis, and our only resource is what is called "high farming," concentrating fertility, and the restoration of wheat-growing properties in our soils by such means of enrichment as agricultural science discloses. Our farms are *too large* and our course of husbandry too loose and careless to secure to us all the advantages which our position promises. Almost every farm has beds of muck which should be thoroughly mixed with lime and used with manure, the benefit of which is immediate as well as permanent. It is to the application of science to farming that we are also indebted for greater care in the selection of *seeds* appropriate to the climate and soil, and of the finest quality. It is true that long experience had proved that certain crops always failed in certain latitudes; but the *why* and *wherefore* was for science to discover. He who knows a fact may be said only to half know it until the reason of it—the rationale—is impressed upon his understanding. A judicious rotation of crops and seed of the finest quality is as necessary as a cross in stock to produce the noblest specimens.

It will thus be perceived that the conditions of good farming are:

1. That the soil be in a proper *physical condition* as to dryness, porosity, &c.
2. That it contains a *due proportion of fertilizing and stimulating* qualities appropriate to the growth and nutrition of its crops—*plant food*.
3. That the *seed* be of the finest quality and adapted to the climate and location.
4. That the requisite *labor* is used in its preservation from weeds and other enemies of its growth.

And this leads me to notice the fact that much has been done of late towards discovering what are the peculiar bugs, flies, worms, and other vermin that make such havoc with our grains and flowers. The patent office at Washington has now in its employ scientific men of the highest accomplishments making observations upon the nature and habits of all these animals; enemies of the tobacco and cotton plants, of the apple and plum, of the peach and pear, of the wheat and potato and rose. The character of the enemy must first be known before we can hope successfully to destroy him. He will be a benefactor to man who can stay the flight of the weevil, prevent the rot in the potato, (and this a discoverer claims he is able to do,) drive the curculio from our plums, the worm from our peaches, and the slug from our beds of roses; to which we may add from recent experience, the grub from our cornfields and the grasshopper from our meadows. It is supposed by some that this kind of vermin is increasing, and that the destruction of our birds, which not only delight and cheer us with their songs, but subsist on our enemies, aggravates the evil; and that we thus pay the penalty of our children's cruelty by the ruin of our crops and the abortion of our toils.

But the complete farmer has not only his stock and crops, but his *orchard* and *garden*. It is time indeed that some more attention was given in our county to the orchard. Fifty or sixty years since this was deemed a subject of the first importance. Superb orchards of grafted fruit were planted and it was supposed they would never fail; as a result new orchards were not set out, which require from fifteen to twenty years to yield a full supply; and as the ancient trees decay and bow themselves to the earth, many a farm will be for years without its accustomed fruit. Think of the difference in value of a farm with a full bearing orchard, one tree often yielding more without labor than an acre of land under tillage. And experience, moreover, shows that the apple will bear abundantly on stony and uneven land, in elevated regions where a plow cannot go. This county has not made even a beginning in the pomological department. There is room and necessity for ten thousand orchards of the finest varieties of apples and pears without interfering with a single rod of land now usually cultivated. Let us look to this more closely. A single town should plant more fruit trees than the whole county calls for. The old varieties are mostly gone or attain a growth and richness inferior to what they once exhibited; it may be from want of proper cultivation; it may be because the peculiar pabulence they draw from the soil is exhausted; or it may be that the *life of the tree* is gone, especially when it is noticed that grafts in the most luxuriant stocks often perish without any seeming cause about the period when the parent stock decays. Parent and children, however, removed from each other, passing away together by virtue of a mysterious and subtle influence that lies deeper than the chemist's analysis has yet penetrated. It is one of the deep secrets of nature, perhaps past finding out. How nobly the orchard repays the care of its culture! aye, a thousand fold. The old pear tree yielding its full crop for an hundred seasons. Grandsire and sire, and son, sitting successively beneath its branches. The apple and cherry not so long lived, but giving their luscious crop without plowing or sowing, or labor of man, but to take it.

But the *Garden*—has the farmer anything to do with that? Formerly it was supposed he had not. There was a patch of weeds interspersed with straggling onions, pea vines, beets and cabbages, near the dwelling, into which the women occasionally entered, but the men seldom, except to plow it or plant a few potatoes in one corner—and this scene of confusion neglect and rubbish, was courteously called the *garden*. It was occasionally invaded by unruly cattle or swine; it was constantly visited by every fowl of the barn-yard, whose busy claws did the main disturbance of the soil. There is no caricature in this, although I am happy to say that the garden is fast raising into consequence and respectability, the case is far less common than formerly. Horticulture is as necessary to good farming, both for use and ornamentation, as any other branch of husbandry. It is a little farm in miniature, a specimen gem of what the whole should exhibit in cleanliness, good taste, variety of production, and vigor of growth. The garden was man's first dwelling place and care, and is associated with

all that is innocent and rural. Its image comes back with our earliest recollections; there we ran, or romped, or sported; the swing was suspended from the tallest trees; the bee-hives lined the fences, and in the corner was the well where swung the old oaken bucket above the mossy stones that enriched the bright clear waters. There is no apology for a poor, late, barren, weedy, tasteless garden, it is utterly inconsistent with cleanliness or economy.

One thing more in this connection, and I shall close this branch of our subject. I refer to the general *style* and *arrangement* of the farm. Not simply to the neatness of substantial fencing, thorough ditching, and the nice cultivation of the fields; but to the higher characteristics of *well studied landscape*; the thoughtful and significant arrangement of trees, and shrubs, and flowers, so as to hide rough inequalities, fill up the opening, make vistas for prospect, and shady walks for contemplation; to catch at one view the blue of the sky, and at another the blue of the mountain; at one point the distant town, at another the sparkling water. Ah! what language there is in trees! what significance in their endless variety of shapes, and color, and position. In the evergreen, with its taper top, cone body and whispering voices; in the superb pomp of foliage that towers in our maples; in the graceful sweep of limb and arching curve that gives such beauty to our elms. How perfect when alone, with every twig stretching out its tiny hand to greet the sunlight and the shower. How beautiful in clumps and contrasts those gentle sentinels that bespeak the intelligence and taste that has selected their position with a wise discrimination, and watched the unfolding of every leaf that trembles in the breeze.

This denotes the cultivation of the *mind*; enriches nature with human thought and skill, and blends the delicate processes of man's mind and soul with the quiet workmanship of the Almighty in his rural temple. And in these two last departments lies the sphere of woman—in the garden and in the landscape. For, while she is not to act as the drudge that, in a savage state, plants and hoes and provides all food except from the chase; nor is she, as in many households, to toil only as a domestic slave in milk and meats and clothing, bending, an unpaid pack-horse, under her burden; her rights are higher, her obligations wider than all this. While she sweetens the domestic board with her intelligence and life; while she orders her household with prudence and economy; while she stands an example to her children, and a stay and counsellor to her husband, she has peculiar qualities by nature to direct and mould and fashion all those arrangements into which taste and delicacy enter. Who, like her, can select, arrange and prepare the seed, the plant, the flower? who train the vine with such grace and delicacy? who plan the winding walk, the shady nook, the sloping lawn, making nature speak to us with all her voices of majesty or gentleness, in every opening rosebud in the garden, and in every shadow that creeps quietly over the lawn. Woman's nicer, keener instincts read and interpret the significances of nature, and link her material expressions to man's spiritual perceptions and life.

Three special agencies in addition to practical farming are now in operation to forward the interests of agriculture :

1. That of the Government, through the agency of the Patent Office.
2. Agricultural schools, where the theory and practice are combined and taught thoroughly, like other professions.
3. Agricultural Societies, State and county ; Farmers' Clubs and Fairs, where all products and implements are collected and inspected, and each, whether mechanic or farmer, acquires a knowledge of what has been attained and how. And as the mouth-piece of all these, the Press, that heralds far and near what is thus presented.

Your patience would not last, should I attempt much comment on these separate agencies. The Patent Office is doing much by sending out specimen seeds for trial in various districts, some of which prove highly valuable ; and more especially in their able and interesting reports, which are eagerly sought for and intelligently studied by our reading farmers. Schools for teaching scientific agriculture are doubtless as necessary as in medicine, law or divinity. They combine theory and practice, and test speculation by actual results. They should be generally established and liberally patronized here as on the other continent.

But it is the Fair, the exhibition to the *eye*, that speaks more potently ; the generous rivalry it provokes ; the invention, taste and industry it elicits ; the party and his production stand out before the gaze of his fellow citizens ; there it is ; the beautiful result excites universal attention ; he is proud, happy, successful ; the mode is open to the knowledge of all, and hundreds start in the career of a keen and thoughtful emulation. Here judicious comparisons are instituted ; here new processes are unfolded ; here new instruments are tested and judged of ; and here we meet face to face to brighten the chain of friendship and cultivate our social sympathies in the exchange of thoughts, sentiments and feelings, that make us as children of a common family.

Some complain that in our agricultural exhibitions we have nothing *new*—that year after year we present horses, cattle, sheep, pigs, poultry and potatoes, corn, squashes and tomatoes. They have been at one Fair and that satisfied them, as they are all alike. They have taken in the whole thing at a glance and have nothing more to learn. I would like such a person to tell me what he means by saying there 'is nothing *new* here. I deny the truth of the allegation, and assert on the contrary that it is *all*, or principally, *new*. Those animals and articles were never here before, some of them not a year old ! What breeds they came of, how reared and tended, what care and what feeding, or what soil, plowing, manuring, cultivation, produced this or that ; who has heard of that before ? In truth these fairs are a perpetual novelty. The *institution* is the same, but its substance and essential elements have all the charm and instruction of an ever changing arrangement. Who ever saw such new, improved implements of husbandry and housewifery ? The lady reading

while the dog churns, and the gentleman mowing while he supposes he is riding in a sulky.

In society every man has his appropriate work. Some there are whose function it is to work in the department of thought, of education, moral and spiritual, as teachers in school, pulpit or press, and who, from constitutional aptitudes and cultivation can do this better than others. Some again have a taste for industrial employment in the shop or in the field. They have the nice skill for handicraft to fashion, polish, mould, combine, invent and apply useful mechanisms and conveniences to their appropriate uses. Or they love rural and agricultural labors and results; they have a keen discernment of stocks, breeds and animal symmetry; love to study the habits and watch the growth and development of flocks and herds; take delight in the progressive unfoldings of grass and grain, and can work and watch and manage the farm better than do other things. What I desire to say here, without insisting much upon the fact of natural taste and aptitude for a special employment is this: that above all things it is necessary that we should be thorough and accomplished in whatever we undertake to do. Any department of thought is so vast, rich and various, that an ordinary life is not sufficient to exhaust its fertilities, and make us acquainted with all its marvels. The perfection of social life lies in the division of its labors. No one mind or hand can accomplish great results in every department. There must be concentration and an individualizing of pursuits, so that the mind and the hand become skillful from repeated efforts in the tasks assigned them. Thoroughness implies first that our *intelligence* combines with and illumines our toils. Physical labor is only machine work, and poor machine work at that, unless animated by an informing soul, by an intelligent comprehension of what that labor intends, and when and how, and after what fashion it may best be accomplished. Without intelligence all toil degenerates into mere *routine*. The man acts from imitation, reproduces only what he sees done, and travels like a mindless serf in the same old track, rutted deep by the practice of former generations. What a contrast between the labor of an American and of most Europeans in this respect. Labor, to be *dignified* must represent and symbolize thought; must be the expression of what the brain has comprehended and intends through manual dexterity. It is this that lifts drudgery of the barn, the yard, the field, into consequence and respectability; gives it sensibility and significance; makes it in fact representative of a scientific and intelligent culture. This thoroughness, moreover, is the omen of *success*. Who are the men who are always complaining of ill success in life? who, first, can find no work to do; and, second, never succeed in doing it; talking of their ill luck, and the poor appreciation society has of their talents. Are they not mainly our superficial and indolent men? too superficial to form a sound judgment in respect to anything, and too indolent to perfect themselves in any occupation, or become fully accomplished in any employment. They float about without stability of object or labor, "every thing by turns and nothing long." If educated in any calling they

have no taste for it, and leave it as soon as they can. In their office or store they are never found, in the shop their tools lie idle, on the farm they can speculate and dream, but the solid business of the plow or the reaper is too much for them. Thoroughness is everything. It makes the great cardinal difference in men. One succeeds because he fully understands his work and does it perfectly; another fails, in the same circumstances, because he is superficial, impatient, and does nothing effectually. A steady force, whether mental, moral or physical, well applied and constantly in action, effects far more than spasmodic efforts, even when backed by stronger power. I wish I could inspire every farmer here present, with the sentiment "*Honor your calling and cling to it.*" Nothing is nobler, manlier, healthier. A notion that other professions are *easier* and more *genteel* has robbed our farms of much of the mind and muscle that should have been given to fructify and adorn them. He that owns no land must progress as he can in any calling to secure his bread, but the man that owns the soil on which he stands should never leave it while he can stay. He has that in his hand for which the men of other vocations are toiling. What is the dream and ambition of the merchant, the doctor, the lawyer, but to have land in their old age, where in the quietude and sweetness of nature, they may pass the evening of their days. For this they toil and suffer and strive as no farmer toils and suffers and strives. Then wealth melting away often in a night, and the accumulation of a life-time imperiled every hour. The first minds of our nation in former years were glad to turn aside to the actual labor of the farm. Cincinnatus called from the plow to empire has had its counterpart in spirit in the example of many of our judges, ministers, lawyers and statesmen of a former day. Peter Parley, attributes this age of "*much talk* of bronchitis, neuralgia, mental and physical dyspepsia, of demagogueism, transcendentalism, of new notions, some taking to cold water and some to mint juleps, some to raw vegetables and some to hot slings"—all agonizing and growing intense—to our want of field labor, which would work off these vapors that produce such a crop of evils; and recommends that we go to the habits of other days, when ministers, judges and governors wrought occasionally in the field. The Father of his country loved his farm, to its fields and woods his spirit fled from the sterner employments of the camp, and on the shores of the Potomac, in the rural home of his race, he spent the evening of his days. He tilled and drained until Mount Vernon was a model of neatness and fertility. Alas that it should now be like a howling wilderness, trees growing in the ditches, now filling up by neglect, and dilapidation marking every building he erected. I trust the patriotism of the nation, which is now aroused on this subject, will speedily redeem this sacred spot, wherein his life was spent and his bones repose,

"Alike his birth and burial place,
His cradle and his grave,"

from the ruin that threatens it, and readorn it as a political Zion to which the tribes may go up to renew their faith and rekindle their patriotism.

Will any one refuse to lay one stone, in a temple so blessed and holy. I trust New York will not be found wanting in this noble emulation.*

It might be interesting to inquire in this *fast* age, how far the regular and even march of the seasons—the steady clockwork of seed time and harvest—summer and winter, which admit of no disturbance and no acceleration—lifting up in the eye of man their great finger marks, which he neglects at his peril—tends to moderate and repress his erratic activities and expectations, to limit those wild impulses that run mad with indefinite anticipations, and leave him content with one corn and cattle crop a year! A most difficult agricultural problem is to accommodate the high wages of labor to the low profits of production. Many farmers fail altogether to pay their way, and many more, after satisfying the expense of their working, leave nothing for the owner. When this is the case, it can be remedied partially by one of two ways.

1. By altering the course of husbandry so as to employ less labor, laying down to grass, &c., changing from grain to cattle or sheep, which do their own reaping.

2. By using machinery, labor-saving implements, as far as practicable.

If these fail, we have no resource, as intelligent labor seeks the rich lands of the west, where it can own its own farm and toil for itself. And herein lies the inexplicability to us of most courses of English husbandry. Twenty pounds a year for an able bodied man would justify a different system from ours, where twice that sum is the average for labor.

Gentlemen, where lie the *steady* and conservative elements of this nation? Where are the forces that will hold us on our career, and keep us to our principles and our mission? Do they look out of the pale faces that rush to our factory windows for a gasp of fresh air? Do they sit at the tables of offices, or live in the atmosphere of courts? Are they bound up in ledgers, or built in the brick and mortar of our towns and cities? Do they blaze out of our pulpits, or thunder in our forums? I tell you nay; but go out into the field, and see the foot-print in the fresh furrow, look where the grass and the corn are falling before the reaper; or go to the evening fireside, where intelligence, and thought, and industry abide, where simplicity and economy make their home, and affectation and effeminacy are strangers; go there, and in the strong muscle, and patient energy, and thoughtful brain, and stern *individualism*, you will find it. It is scattered over millions of acres, yet not a particle of it is lost; it speaks only occasionally and in great junctures, yet its nod is the nod of fate, and its decree is the fiat of omnipotence. Let the farmer respect himself and his calling, let him concentrate his mind upon it, let him study it scientifically, and he will keep it where it belongs, foremost in the respect of others. He shall have its honors, not dazzling, but enduring. He shall have its pleasures, not intoxicating, yet of noble zest. He shall have all its purity unalloyed, and while he may also sit as a judge, plead as a lawyer, legislate as a statesman, instruct as a divine, he shall yet glory in the prouder consciousness that he is, above all, an American Farmer.

* This work has been completed and Mount Vernon saved.

ANNUAL ADDRESS,

DELIVERED BEFORE THE JEFFERSON COUNTY AGRICULTURAL SOCIETY,
SEPT. 23D, BY THE PRESIDENT, ALANSON P. SIGOURNEY.

Ladies and Gentlemen:—

We have assembled upon this, the 30th anniversary of the Jefferson County Agricultural Society, to interchange congratulations, improve the social qualities of our nature—extend our acquaintance with neighboring townsmen—enlarge our qualifications to fill the avocations assumed by us in the great drama of human life, by reciprocal counsel and mutual interchange of experience and observation—to exhibit productions of the soil, nursed by our care,—animals raised upon our hills and plains—implements to lessen human toil, the “handywork” of the mechanic—evidences of skill in the performance of the arduous duties of wives and daughters—specimens of art, and samples of taste from every department of human industry within our limits.

We may, with great propriety, congratulate each other upon the general health of our inhabitants; and that the present, as the past, is a year of general prosperity; and that *plenty* crowns our labors. No “pestilence that walketh in darkness” has been permitted to decimate our numbers, or drouth or flood to blast the hopes of the husbandman. The soil, with the aid of labor, has furnished us a *surplus* of the *necessaries*, and a rich supply of the *luxuries* of life. We *should* be, and I trust, *are*, truly thankful to the Giver of all Good for these and the innumerable blessings we enjoy. The Pioneers in the settlement of our beloved county could not thus congratulate each other. Sturdy forests covered her surface, by them converted into beautiful fields, upon which they subsequently erected comfortable dwellings, now the abode of about 25,000 families, comprising 66,000 souls; all engaged, *or should be*, in those pursuits of life, calculated to enhance the interest, prosperity and happiness of themselves and the race of mankind.

Our fathers, at whose approach the shade of woodlands retreated, where are they?

Our mothers, companions of the axe-men and equal sharers in the toils and privations consequent upon the settlement of a new country, inhabited only by the wild beast, where too are *they*? Memory, true to its task, in its painful silence, answers, gathered with their fathers! Peace to their quiet dust,—their ashes make sacred our inheritance. Our thriving

villages, evidences of prosperity, were located by their wisdom and sagacity. Few indeed of that noble band remain to interest us by their rehearsals of the events of early life, or aid us by their counsels—let us cheer their pathway “to the friendly tomb.” But to the present.

We have assembled as a *society*, named *agricultural*. The object of its formation is set forth in the first articles of its constitution, and declared to be “to promote progress in agriculture, horticulture, the mechanic and household arts.”

In commenting briefly upon the declared object, just quoted, I hope to be excused for not pursuing the beaten track, by eulogizing the farmer—commending him especially in the choice of his occupation—taxing rhetoric and indulging in oratory to convince him that his avocation is not dishonorable—that labor does not necessarily disgrace him—that, in fact, he is engaged in the most honorable pursuit followed by man.

The legitimate pursuits of men, calculated to advance mind—meet the mental, moral and physical wants of our race, are alike honorable:—and the selection an individual makes for himself neither honors or disgraces him. The poet has well said—“honor and shame from no *condition* rise; act well *your* part, *there* all the *honor* lies.” No, fellow farmers, we are neither elevated or depressed in the scale of honor by the pursuit of our chosen occupation. If any vocation of life takes precedence in importance, it is that of the instructor of children and youth. He deals with mind, immatured mind—gives direction to its mode of thought and reasoning, and plants his own mental impress upon his youthful pupils. The true teacher is a model of what community should be.

Agriculture, in a circumscribed sense, may be defined, cultivating the soil for the purpose of raising grain and other field crops for supplying food for man and beast.

Much might, with great propriety, be said upon the rearing of stock—improving our herds of cattle, sheep and swine by the introduction and use of the better breeds; but this and many other departments must pass unnoticed. I cannot withhold the expression that great credit is due to many gentlemen of our county for their efforts in this direction; and I trust that no far distant day will find progress unmistakable in this department.

Our county comprises an area of 716,513 acres, of which 465,222 are improved, and the balance “in a state of nature.” According to the census of 1855, 146,297 acres of the improved lands were appropriated to the raising of the different varieties of grain and root crops, and the balance to meadow and pasturage.

The main question with farmers relative to tilling our lands is, what method should be pursued and what treatment the soil receive to secure remunerative crops and prevent ultimate exhaustion. Frequent plowing and thorough seeding are indispensable to the attainment of this desirable object. The severity of our winters speedily annihilates our desirable grasses, and wire and June grasses assume their places. To avoid this

evil and prevent pecuniary loss, the turf should be plowed under in the fall and sown with peas, oats or barley, or planted with corn, beans or root crops the succeeding spring, using the cultivator and harrow only, thereby leaving the turf undisturbed—the crop removed, the land should be again plowed in the fall and immediately sown and seeded, or the sod left to the action of winter frosts, and sown and seeded at the earliest practical period the succeeding spring, using cultivator and harrow only, thus leaving turf where found, which, as a fertilizer, is equal to an ordinary dressing of manure.

There is a great diversity of opinion among good farmers as to what *time* and in what *manner* to apply manures to make them most available. From experiments of my own I have arrived at a conclusion, to *me* satisfactory. Coarse unfermented manures should be spread on turf and plowed under, whether used in fall or spring. Compost, and that thrown from stables, spread during the winter or early in spring upon lands which have been thoroughly plowed the fall previous, and thoroughly mingled with the surface soil, by use of cultivator and harrow.

Two successive crops, upon lands not at convenient distance from manure or compost heaps, are sufficient to secure profit and continued fertility. I think you will agree with me when I express the firm conviction that too much of our lands are subjected to the plow an unreasonable portion of the time—and that a *far greater portion*, for want of thorough tillage, does not pay five per cent upon its estimated value. May we not reasonably believe that our *interest* will speedily induce *progress* in this primary department of our employment?

Horticulture—the art of gardening, is next in order in the “article” above quoted, and is deemed of sufficient importance to demand *progress*. It is gratifying to the resident of our county to travel through her various towns, and notice the very many excellent gardens located near the comfortable dwellings of their owners—yet others of a different character, which exhibit the want of a due appreciation of a “good kitchen garden,” meet the eye. I shall be excused for not enlarging upon this department, as it is properly submitted to an able committee, better qualified to interest you, and to whose report we shall soon have the pleasure of listening,—yet I may be allowed to say that every cultivator of a garden would “*promote progress*, advance his interest, and add to the comfort and convenience of his family by appropriating a portion of his grounds to the cultivation of a fruit yard, in which can be found the strawberry, gooseberry, raspberry, grapes, plums, cherry, apple, peaches and pears, the last two of which can be easily cultivated by engrafting into the common thorn bush, found upon almost every man’s farm, is natural to, and flourishes well in nearly every variety of soils.

Mechanic arts—these open a field to which the human mind can set no bounds. To attempt a description of their importance, in the varied ways in which man is made wiser and happier by their study and application,

would be vain, would be futile. *Agriculture* is truly denominated the *basis of individual and national wealth*,—but what *progress* could be made in practical agriculture, unaided by the mechanic? He clothes us, builds our dwellings, to shield us from the pelting storm, furnishes our implements of husbandry, prepares nations for the successful prosecution of commerce, produces and lays the track for and furnishes the “iron horse,” and his carriages, makes and adjusts the type from whose impress intelligence is sent broadcast throughout christendom—and unites nations by a wiry coil, the vehicle of thought, the channel for inter-communication, whose bed is broad Ocean’s base, and whose covering, Atlantic’s billows. Majestic conception! Mechanical achievement, without a parallel in the history of the world! Our county has been nobly represented, in this crowning effort of the mechanic, marked by signal success, in the person of one of her sons, Wm. E. Everett, Esq., eminent for his genius, sagacity and mechanical skill.

The *progress* in mechanical arts, applicable to the use of the tiller of the soil, is so diversified as to forbid enumeration on this occasion,—yet I cannot forbear naming the *plow* the *first*, and I may well say the most important implement in farm culture; and express the conviction that its near approach to perfection defies further competition, and I entertain the opinion that the mechanics of our county furnish an article not surpassed for utility by those of the State or Union. I cannot avoid the conclusion that the action of this and her kindred societies has done much to secure this desirable result. Next to the plow in importance, is the cultivator; operating as a thorough mingler of soils, and securing, by its use, that depth to seed which enables its blade to contend more successfully with drouth and frost. But to pass without comment the improved harrow, the horse rake, the use of the latter of which is equal to the labor of a good workman to a farmer who cuts and secures thirty acres of grass, the carrot-weeder, the potato-digger, the seed-sower, corn-sheller and grinder, gang plows, etc., etc., all evidence of progress in the mechanic arts, as applied to agriculture, I come to that wonderful labor-saving machine, the majestic mower and reaper. Do I exaggerate in saying that the crops of hay and grain raised in our county the present season, could not have been secured by the farmers in proper season, without the use of this machine? I think not. The constantly increasing scarcity, and consequent advancing wages of good farm laborers, and the necessity of securing crops at maturity, combine to coerce the farmer to resort to the aid of machinery in the securement of his crops. The inventive genius and mechanical skill of a Ketcham, were directed to this opportunity to “promote progress in the mechanic arts,” and, by his industry and perseverance, he became the pioneer in meeting this demand. Competition in this, as in every department of human industry, has secured the allodgement of 200 models of different machines for the same purpose, in our Patent Office—each inventor claiming to have excelled his competitors in the production of the best article. Sufficient for our pre-

sent purpose is the announcement that Jefferson county is represented in that office by one of her citizens, D. O. De Wolf, Esq., whose machine is evidence of inventive genius and mechanical skill in its author, and constitutes its own recommendation; and the enterprise of her mechanics has induced at least four able and efficient companies of their number to embark in the building of as many different styles of machines, each and all of them adequate to the accomplishment of the object of their manufacture. Economy demands their general use; and I have only to regret that such extravagant prices are demanded for their purchase,—so extravagant, indeed, as to force the conviction that the profits realized by their manufacturers, when compared to those upon other farm implements, are equal to a ratio of three to one; yet I indulge the hope that time and competition will speedily abate the evil, and bring the machine within the reach of every farmer.

The spirit of the age will not allow a man to unite two pieces of wood by string or other attachment, and, one in hand, whip, with the other, the grain from his sheaves.

The mechanic, eager to relieve the farmer from this most undesirable application of human muscle, furnishes the thrasher and cleaner, by which the power of his horse or ox can, more speedily and with more economy, separate his wheat from the chaff. Mechanics, we acknowledge our indebtedness to you for your co-operation with us in efforts "to promote progress in agriculture, horticulture, the mechanic and household arts."

The household arts comprehend all that relates to domestic management, and, in their application, combine, among others, the duties of the manufacturer, the mechanic, the teacher. The intelligent mother, the judicious wife, only can do justice to this division of our subject. A few thoughts, and I leave it for abler hands.

True, the old spinning wheel and loom, by which flax and wool were changed from "the raw material" to the "broad yards," to "clothe the little and the great," have almost ceased their music, and the piano and the melodeon have assumed their places; yet sufficient are still used, as our present exhibition well attests, to justify us in classifying manufactures as one of the household arts; and whether this general abandonment of the manufacture of the coarser cloths, by the family, for common use, conduces to *economy*, is a question now in process of solution, and time and experience, associated with the policy which governs our national councils, will give us the answer.

Mothers, allow me to suggest, that, in the instruction of your daughters, this department of education should not be neglected. What family can be found, possessing the *least* enterprise, or having any regard to economy, that does not act the part of the tailor, the dress-maker, or, in any degree, interfere with the avocation of the milliner? Indeed the ambition of the ladies to relieve their husbands and fathers from what they deemed unnecessary burdens, and to employ leisure hours, a few years since, adopted, to some extent, the custom of manufacturing their own *shoes*, and com-

pelled the merchant to furnish soles, ready punctured to receive the thread. Whether the experiment proved to combine progress and economy, or not, I am unadvised; if not, the "theory and practice" are discarded, and the shoemaker is left in the undisturbed prosecution of the labors of his chosen occupation.

I have said, *the true teacher is a model of what community should be, that he plants his own mental impress upon his youthful pupils.* But who can truly estimate the importance and responsibility of *mothers*, as common educators? Mothers, under Providence, 'tis yours, aided by your husbands and public teachers, to leave a generation qualified for weal or woe. Your instructions, by precept and example, which should always be harmonious, are the first received and the last forgotten. The moral and religious training of your children never dies; the mild look, the kind correction of little errors; those innumerable attentions in supplying their every want, leave impressions that time and the combined elements of a wicked world cannot efface. True, your son may be allured from the path of honor and virtue, by unfortunate associations with the "wolf in sheep's clothing," whose commendable exterior, urbanity, and liberality in the use of means, earned by other hands—the accumulation of high-minded and honorable parents, now sleeping—or the accidental receipts, fraudulently acquired by gaming, in some of its numerous and attractive phases, that please the eye and flatter youthful vanity; yet, if drawn by the current into vices, deep as the "blackness of darkness," the moment *reflection* awakens him, in his wicked revelries, the warnings of that *mother*, perhaps silent in death, *flash* across his mental vision, and his heart, baptized in iniquity, increases her pulsations, and the silent tear moistens his fevered cheek; if saved from the vortex of ruin, the antidote has been administered by a *mother*; if *lost*, his last communication will acknowledge its administration, and bewail his disastrous end. But to return. The two great staples of our county are butter and cheese, and their manufacture is a prominent department of the household arts.

Our county has ranked *second* among the counties of the State in the quality of her *butter*, as the price it commanded in our principal markets, New York and Boston, attests; but our *cheese* is not surpassed, in this respect, by our neighboring counties, States or England, the market value in our own and foreign countries being the evidence.

The county of Orange, in the southeastern portion of the State, has been prompted, by interest and a commendable pride, to excel in the manufacture of butter, and has realized a rich reward for her effort, not only in reputation, at home and abroad, but in pecuniary returns, commanding from two to five dollars per cwt. for her product in advance of the price realized by us for our surplus. According to our last census, the county of Orange made from the milk of 40,187 cows, 3,285,587 pounds of butter, and 80,660 pounds of cheese. Allowing that the milk which makes three pounds of cheese would produce one pound of butter (which is the common estimate), the total product, *in butter*, would have been 3,312,473 pounds.

These cows, with 48,852 horses, mules, cattle, and sheep, were pastured upon 138,113 acres of land.

Jefferson county, at the same date, occupied in pasture 196,472 acres of her surface, over which ranged 49,472 cows, from the milk of which were made 3,949,608 pounds of butter, and 2,819,459 pounds of cheese; which, reduced by the above rule, would make an aggregate of 4,889,427 pounds of *butter*; while upon the same surface fed 110,257 head of other stock, as named above.

To pass unnoticed the advantage possessed by the cow of Orange in the proportionate amount of pasture upon which she fed, we may, with propriety, advert to the fact that the farmers of Jefferson produced an equivalent to twelve pounds of butter per cow over the farmer of Orange, worth, at that date (1855) \$3; yet at the medium difference in price (3½ cents, "Orange County" being quoted at *one* price, and "State Dairies" at *another*), the value of *butter alone*, manufactured in our county, fell below the sum that was or could have been realized for the same amount of *Orange county* butter, \$138,236.28—a sum sufficient to have paid the enormous State, county, and town taxes upon our county for 1857, and leave a surplus in the hands of the butter-makers of \$34,776.15; but the distinction has ceased to appear upon our "prices current," and Orange county butter has lost its attractions.

Are the wives and daughters of Orange *retrograding* in this department of household arts, or are those of Jefferson *progressing*? The former, *impossible*; the latter, *affirmatively* true; and yet, I doubt not our able viewing committee will tell us *improvement* can still be made. While we may entertain a gratification at not being *excelled*, and that this evidence of *progress* marks our history, may we not *hope* and *believe* that the time is not far in the future when Jefferson county butter will be quoted at highest figures? To accomplish this object, but one end is to be attained: ☞ Uniformity in the best mode of its manufacture; try the following recipe; if you fail to produce a *good article*, abandon it, adopt a *better*, and give it publicity:

Place your milk in rooms and vessels, remarkable for cleanliness and freedom of circulation for a proper quantity of air; skim as soon as milk is soured; allow cream to stand in cool, clean, well ventilated cellar, not more than forty-eight hours, well stirred each twelve; graduate temperature for churning at sixty degrees; free butter from milk by rinsing with pure spring water (using ice in hot weather); weigh your butter *fresh*, add three-fourths of an ounce of pure, dry, well pulverized rock salt to the pound; work in butter-worker, *rapidly*, if warm weather, until the first appearance of the last particle of brine. Pack in tubs or firkins that have been soaked in pure brine not less than six days, putting a small quantity of salt in bottom of tub and rubbing sides with same before filling with butter; secure compactness by pressure or pounding; fill to within an inch of the top, cover with cloth, the remaining space filled with wet salt completes the process.

This course pursued by every manufacturer of butter in the county, and "*Jefferson county butter*" will be a sufficient recommendation for its sale in any market, and find a special allotment in our "Price Current." Ladies, it remains for you to determine whether this suggestion is worthy of your adoption, and I cheerfully submit to your decision. This is a department of human industry over which *you* preside. That the *progress*, thus far made, is the result of *your* efforts, we are well aware, and that your ambition to place our county in the van of her sisters, not only in the manufacture of *butter*, but in every department of mental, moral, and physical development, is equal to that entertained by your husbands, fathers, or brothers, is unmistakably apparent—your presence on this occasion is evidence of this truth.

Cheese is *second* in importance as a product of our county, in the present and prospective policy of our farmers, if the quantity made, compared with that of butter, be a correct criterion from which to judge.

Dairying, as a leading pursuit of the farming interest of our county, is but in its *youth*, and is it not a just subject of self-gratulation that we have overtaken the counties of the State in their *manhood*, in this department? Although our cheese has reached the maximum price, yet the great difference in the qualities of our best and poorest dairies gives evidence that a want of uniformity in their manufacture still exists, very desirable of obtainment; and I doubt not the report of our viewing committee will furnish "statements" of dairymen, whose products they have examined, and tested their merits, which, when published, will be productive of *progress* in this branch of great private and public interests.

The subject of agriculture, horticulture, the mechanic and household arts, presents a field so vast in extent and so multifarious in its departments as to preclude the possibility of following it in all its ramifications on an occasion like the present, yet you will indulge me in alluding, briefly, to a very few departments which demand *progress*. It is apparent to the most casual observer that our early set orchards of fruit trees, like the hand that planted them, have grown old and are rapidly disappearing.

Trees are like *men*. Their existence may be appropriately divided as we divide human life, into different stages. Our old orchards furnish a largely diminished quantity and quality of fruit, and they cannot be improved by grafting, as the tree has lost the vivacity of youth and cannot endure the change.

The cultivation of fruit, upon lands and in a climate congenial with its growth, is conceded to be a business yielding ample returns on capital and labor invested. Let us re-plant our orchard grounds, leaving the old trees to meet our wants until the youthful trees demand their removal. We have within the limits of our county at least four cultivated nurseries, in which are found every variety of fruits congenial to our climate, from which every farmer and every gardener can obtain a full supply to meet his wants, and avoid the contingency of sustaining loss by purchasing trees from abroad, in their attempts at acclimation.

Much credit is due the enterprising owners and cultivators of these nurseries for not only furnishing us with every variety of the choicest fruits, but with ornamental shrubbery with which to beautify enclosures about our dwellings.

Farmers—allow me to ask in what single effort can we make *progress more apparent* than abating the nuisance of using our highways as common pasture grounds, removing the noxious weeds thereon, and bordering them with ornamental trees? I submit whether or not the condition and use made of lands occupied as highways in our county are not a just subject of mortification to any resident having the least regard for her reputation, at home or abroad. Overseers of highways neglect to obey the law in the destruction of noxious weeds—we *do the same*, and make them a common lumber yard, the depository for brush, worn-out farming tools, old rails, logs, piles of wood, heaps of stone, etc., etc., in many instances. A just sense of the effect which this wanton remissness produces upon our reputation as a farming community, will speedily induce a most desirable change.

We may with propriety congratulate ourselves that we live in an *age* of progress—in a *country* whose rapidity of advancement in the arts and science and the general intelligence of her citizens has not a parallel in the history of nations—in a *State* eminent for her wealth and political importance—in a *county* distinguished for the fertility of her soil, value of her products, her internal resources, the intelligence and enterprise of her inhabitants, and number and rank of her schools and churches.

Permit me, in conclusion, to urge you to go forward in your praiseworthy efforts “to promote progress in agriculture, horticulture, the mechanic and household arts,” by the sustainment of your society, organized for that purpose. Conducted by wise counsels, its beneficial results cannot be estimated—neglected, she will become the organized agent of vice. To prevent such a result, gentlemen, allow me to urge upon you the necessity of attending our annual meetings and selecting judicious and efficient men for your servants in the transaction of the business of your society. The wisdom of our fathers dictated her organization; their action is already chronicled in history, and marks an era when the sturdy sons of Jefferson determined to *combine* their efforts for the more rapid progress of the home of their choice, among her sister counties. They were the pioneers in this public, concentrated effort. Their example has been followed, not only by almost every county in the State, but by the State herself. And shall we shrink from her sustainment, and prove the degenerate sons of worthy sires? Your presence and patience, on this occasion, answer—No!

Citizens of Jefferson—laborers of every name—whether teacher, clergyman, mechanic, artist, physician, farmer, merchant or lawyer, we call upon you, one and all, individually and collectively, to unite in one common effort to promote that progress in our county which shall secure to her that rank among the counties of our Union, held by the distinguished statesman whose name she bears, among the statesmen of the world.

ADDRESS OF DAVID R. FLOYD JONES,

PRESIDENT OF THE QUEENS COUNTY AGRICULTURAL SOCIETY.

Gentlemen of the Queens County Agricultural Society:

A distinguished statesman, who it was hoped, would have delivered the Annual Address upon the present occasion, having, at a late period, announced his inability to do so, and a request having been made to me, founded upon a sort of claim, which the Society seemed to suppose it had on me as its president, to undertake, though at the last moment, to relieve it of the embarrassment in which it was placed, I have not felt at liberty to refuse the aid of my feeble abilities, in an effort to add to the attractions of this rightly termed, "Farmers' Festival," and thus, to some extent, it is believed, further the substantial interests of our Society.

But, gentlemen, you must not expect me to deliver to you, to-day, a well digested or elaborate address—neither time nor leisure has enabled me to do so. I can only furnish you with a light and hurried intellectual entertainment, occupying a brief period of your time, in a few reflections upon the dignity and usefulness of your noble profession, and glancing merely, at some of the duties and responsibilities incident to your position.

Agriculture is the most ancient of arts—its commencement is coeval with the creation—it was instituted by the Almighty, Himself, at the very dawn of man's existence. And it is a beautiful thought, full of meaning, and worthy of your contemplation that one of the branches of agriculture is the only art instituted by God, and imposed as a duty upon man, before the latter had yielded to temptation and been betrayed into sin. It furnished the fit employment for a pure and uncorrupted being, for we read that as soon as God had created man, "He put him into the garden of Eden, to dress it and keep it." The spontaneous growth of all the productions of the earth, at that time, rendered the only duty of man as connected with their culture "to dress and keep them;" after man had sinned, however, then the burthen of *toil* was imposed as a punishment of his transgression.

We are apt to set a high value upon old wine, old books, or ancient relics of any kind—most highly then should we esteem the profession of agriculture—oldest of arts, it comes down to us covered with the precious dust of antediluvian ages!

History, both sacred and profane, informs us that it was practiced amongst the oldest nations of antiquity, and by their most distinguished

citizens. An old writer observes: "In the earliest accounts of the eastern nations we have reason to think that agriculture, has, at all times, been understood by them, in considerable perfection, seeing that they were always supplied, not only with the necessities, but the greatest luxuries of life. As soon as the descendants of Abraham were settled in Palestine, they generally became husbandmen, from the Chief of the tribe of Judah to the lowest branch of the family of Benjamin. High birth or rank did not, at that time, make any distinctions, for agriculture was considered the most honorable of all employments, witness the illustrious examples of Gideon, Saul and David."

I hope, my friends, that you may be induced, if you do not now, properly to appreciate the dignity of the art of agriculture. It has about it all the elements which serve to make it an honorable profession. It has age, as I have already remarked, to commend it. It has been engaged in ever since the world's creation, by men of the highest character, the loftiest intellect, the most intense patriotism. Royalty has been honored by mingling in its duties. Statesmen of our own and other lands have laid the foundations of their future eminence and usefulness to their agricultural pursuits, and some of the most learned of our divines date the beginning of their religious lives to their early connection with agricultural employments. The daily communing with nature—the constant witnessing of God's providential visitations—the evidence of Almighty wisdom and mercy manifested in all the works of his hands, lead the thoughts away from the grovelling things of earth and center them upon the source and authors of our blessings.

It is the natural effect of agricultural pursuits to elevate the mind. In *them* man has less to do with *man* and more with his Maker.

It is very common, I know, for superficial persons to place, the so-called respectability of agricultural pursuits, below that of what are denominated the professions, and even below that of the merchant.

There is no just foundation for any such claim of superiority on the part of other professions over our own.

I need not say to you, my friends, that there is nothing in the legitimate pursuits of agriculture that is in any respect unintellectual or debasing. There is nothing in those pursuits that cramps the mind or dwarfs the body. There is nothing which should prevent the upright and intelligent farmer from enjoying, and if need be, expressing the conscientious conviction that his life is as honorable as his neighbor's, be that neighbor who he may. Realize, then, and carry out into the world the effect of such realization, the dignity of your profession—not in vain boasting—not in noisy pretensions—not on unseasonable occasions—not in an offensive manner; but, pursuing the even tenor of your way, discharging the numerous duties, which devolve upon you, in the several relations of father, child, husband, friend and neighbor, in all the various phases in which the calls and claims of life may present themselves, exemplifying in your life and conversation the dignified manhood of an American farmer.

I promised to make a suggestion or two in respect to the usefulness of the profession of agriculture. Less need be said upon this head than upon that about which we have been commenting, for the reason that few will question the truth of the position that agriculture ranks amongst the most useful of arts.

Other pursuits have their conveniences, their comforts, their pecuniary advantages, their luxuries, if you please. Agriculture has all these and more, it has the *necessities* of our being.

Other pursuits have more of the fancies, agriculture the realities. The former deal with the poetry, the latter with the prose of daily life, not that there is no poetry in agriculture, indeed there is; but it is the poetry of the Bible, the poetry of truth, not the poetry of fiction. You can spare other employments from the world's use; you may strike from existence the business of the clergyman, the physician, the lawyer, the merchant, the mechanic, perhaps, and the world will still go on, mankind will still live. We should be a barbarous, an unintellectual, a wicked people, if you please; but we should not cease to "live, move and have our being;" we should labor at wonderful disadvantage, we should lack most of the comforts and refinements of life; but we should still have its substantial necessities.

But let us not take this extreme view of the question, it may be said to be impracticable and unfair.

- This, however, may be said with entire truth, with reference to our own nation, and as applicable to our own times, viz: the wider and broader the field of agricultural labor is made, the more general and extensive the employment of our citizens in agricultural pursuits, just in that proportion will the substantial interests of the country be promoted. On the other hand, just in proportion as you desert your agricultural field, allow noxious weeds to take the place of rich meadows and waving crops—flock into your cities, engage in the exciting but unprofitable pursuits of speculation, in that same proportion will your country suffer the disastrous consequences. Experience—our own experience has proved this. There have been times, and they have occurred more than once, when the intoxicating excitements of wild and visionary speculation—the hopes of speedy fortunes—the unnatural and greedy desire of gain, to be acquired without labor, and spent without judgment, have induced many to quit the peaceful and sober pursuits of Agriculture—induced them to leave their prospering farms and happy homes for scenes of unnatural excitement—where trade was feverish and the pulse of business dangerously high and rapid, where capital was fictitious and credit unbounded, where fortunes could be made in a day, and wealth become the plaything of an hour.

All this has been and passed away—many have suffered, and the streets of some of our large cities made to present from one end to the other, the unvarying scenes of pecuniary disasters and financial wrecks. We have seen all this my friends, and some of us, perhaps, have felt its blighting effects. Let us learn a lesson from the past, that may teach us a surer and safer path for the future. Let not agricultural pursuits be either despised

or neglected. Their advantages can scarcely be appreciated; and the more we reflect upon it, the more information and experience we obtain—the firmer will be our conviction that agriculture is not only one of the noblest, but also one of the most useful of arts.

In this brief consideration, which I have given of the dignity and utility of the profession, with which, I cannot but regard it as your good fortune to be associated, I have not deemed it necessary to allude to some other things closely connected with Agricultural employments and which lend them an attraction by no means to be overlooked.

The citizens of the United States, more, perhaps, than those of any other country, feel a just pride in seeking that calling for an honest living which seems to hold out the most certain assurance of independence. The American has been taught from his boyhood to rely mainly upon his own resources for his means of livelihood. Hereditary wealth and privileges are discouraged by our laws. The rights of primogeniture and the laws of entailment, which, in England, serve to keep up a landed aristocracy, have long been abrogated in this country. The eldest son, here, is not designated by blind and indiscriminating statutes for the enjoyment of his father's landed possession; nor, for that reason, assigned a place in the councils of the nation. His destiny is, in a measure, in his own hands, and mainly upon his own energies, industry and integrity must depend his future success in life. Himself alone must forge the fetters which bind him to the earth, or apply the propelling force to the chariot wheels that bear him on to fame or fortune. Each one for himself must be the artist to cut from the rough marble of existence the sculptured monument which is to perpetuate his virtues or his shame.

Is it strange then, my friends, that principles thus instilled into the mind of the American boy, and made an essential part of his education should lead him, as he grows up into manhood, as he is arriving at the period of his existence when he is compelled to seek for himself the way of life, that he should almost instinctively turn to that profession which best promises him the gratification of those propensities which he has been taught to foster. The life of a Farmer! Here is a field for independent action—for manly effort. The nobler impulses of his nature, can here all be nurtured and satisfied, and his laudable ambition in the honest, independent pursuit of wealth and happiness be freely indulged. Health can here be courted with hopeful success; she seldom fails to smile upon the devotee, who bows himself in humble and submissive adoration at the shrine of nature.

If happiness be the aim of life, what higher sources of refined enjoyment than unreserved and frequent communings with her in her quiet solitude.

That life is hardly worth living which shuts us out from the practical realization of the exquisite beauties of nature. Happy, indeed, is he, who, at early dawn, is permitted to behold her smiling face and inhale her invigorating breath—what more rapturous enjoyment than, just as the "glorious King of day, rejoicing in the east," begins his diurnal circuit of the hea-

vens, to witness the myriads of sparkling diamonds, pendant from the leaves and boughs—to behold the miniature but lovely Hebes of Nature presenting, in their glittering chalices, to their lord and master, the dewy nectar of the fields and groves?

If, then, the farmer is permitted to enjoy these high privileges—if his vocation, presenting such advantages, is thus fraught with so many sources of exquisite happiness, it is not to be disguised that certain duties and responsibilities rest upon him which he is not at liberty to disregard. He is responsible for the proper use of his time, his talents, and his means. The fact of this responsibility brings with it certain duties from whose appropriate discharge he cannot with propriety escape.

He owes a duty to society. This can best be discharged by devoting such portions of his time as he can safely spare from the necessary claims of his daily vocation—such intellectual faculties as have been vouchsafed to him, and so much of his pecuniary means as he can conscientiously afford for that purpose, to the mental and moral improvement of those who are brought within his reach, and who make up a part of that society in which Providence has cast his lot. These duties open a wide field for effort and exertion. To those who are actuated by a full and conscientious determination properly to discharge them, it will be quite unnecessary for me to make many suggestions. A firm and unbending resolution to do our duty, will not leave us in the dark as to what that duty is; for you know it is not only the blessed mission of charity to relieve those who are brought within her reach, but also to seek for objects on whom to expend her liberality. The path of duty is plain, in this day and generation, to those who are anxious to follow it; and the various methods in which the farmer may be enabled to meet the demands of Society, will readily occur to him. I will, however, in this connection make an observation or two, calling your attention to a few of those more prominent matters, which seem to my mind, more particularly to claim your notice.

The establishment of schools and other institutions of learning, cannot with safety be disregarded by any one, and especially by the farmer, knowing, as he does, that the general diffusion of knowledge among the great mass of the people, (connected with that moral culture, which at this time, and in this country—in one way or another—in the school itself, or in the Sunday School, or by the domestic hearth, is very sure to keep pace with the rapid march of education,) is best calculated not only to improve the general condition of the society that surrounds him—not only to make his fellow a better man and also a truer friend; but also to add to the security of his own property, always striving, as he should, to keep up that mutual connection between all the different members of the society, in which he moves, as to make it alike the interest of each to guard and protect the rights and property of the other. Thus we are permitted to appeal, not only to the higher motives of philanthropy in urging more frequent and systematic efforts in behalf of the great purposes of education, but also to the more contracted and selfish one of advancing our own individual inter-

rests. Thus benefiting ourselves whilst befriending our neighbor—thus receiving in this mere mercenary view of the case, almost usurious interest upon every dollar appropriated to this worthy purpose.

Let there be meetings frequently held to discuss questions connected with the various branches of Agriculture; no possible injury could result, but probably great good, if they were held by the people of each town once a month, or even oftener. Farmers, as much, perhaps, more than any other class of the community, find it to their interest to be well informed upon all subjects bearing upon the advancement of their profession. The experience of one, the sound suggestions of another, and the scientific researches of a third, combine to furnish advantages to the successful pursuit of Agriculture which cannot be too highly appreciated.

A high duty rests upon all, everywhere, but especially in this country and upon the farmer, to endeavor to promote peace and harmony amongst their neighbors. To the timely advice, and well directed influence of a few men in the community, much good may be accomplished in this particular—discourage litigation in all cases where it is possible, the cause of offence may be removed, or the difficulty settled by peaceful means. A litigious neighborhood is a curse, not only to those engaged in the broil, but also to those who are brought within the reach of its pestiferous influence. A solemn, practical, simple duty, this, my friends, which may be discharged by you without serious inconvenience, and which, properly discharged, confers numberless blessings upon the society that surrounds you.

But you owe a duty, gentlemen, not only to the community in which you live, but to the State. It is the province of the State to extend adequate protection to the property and rights of all its citizens—to aid them in the maintenance of those rights, and to punish their infraction. The several branches of the Government, Legislative, Executive and Judicial are all designed for this object; and that Government fails to accomplish the great purpose of its institution, which is either unable or unwilling to afford all reasonable security to the life and property of the citizens. The people have given up many of their personal rights to the Government with a view to this protection. They have agreed not to take the law into their own hands—not to bring physical force to the punishment of offences against their persons or property, not to be self constituted and often unrighteous avengers of their own wrongs. These matters they have wisely left to the disposition of the State; and it is the duty of the State within its proper sphere of action, not interfering needlessly or officiously with the business of the citizen—not presuming to regulate those matters of daily life, which an intelligent people can best manage for themselves, to see to it that the violated rights of its loyal citizens should be promptly avenged and the violators themselves adequately punished.

Now it will readily occur to you, my friends, that to a State which thus accomplishes the purposes of its organization, certain duties are owing by the citizen, if he would enable the former so to act as to meet and satisfy the just requirements of the people.

One of the first and highest duties, then, that rest upon you, is to yield a willing obedience to the laws. Out of the cities and villages it must be mainly owing to the patriotic conduct of the farmers, in this respect whether this sacred duty shall or shall not be practically enforced—whether a benign spirit of observance of the laws shall pervade the community, or whether disorder, rebellion, mob rule, shall exist in its stead.

I feel that I cannot too warmly and strongly impress upon the minds of my agricultural friends, a realizing sense of the weight of the obligation which this highest of earthly duties imposes upon them; and it is to be deeply regretted that the necessities of the occasion, as I sincerely feel and appreciate them, do not spring from any mere theoretical fear of the existence of the evil alluded to—practical exemplifications of it are frequently brought to our notice. It is but a few years since that an organized mob, (rude, tumultuous and disorderly combinations of men to violate the law, whether consisting of the so-called respectable and intelligent portions of the community, or of the ignorant and degraded, alike constitute a mob,) in a distant State of the Union, took into its own unlawful hands the administration of justice, and the infliction of punishment. It will not do to say that there was an absolute necessity for this course; that officers of Government were either unable or unwilling to see to the execution of the law; that judges and jurors failed to bring the guilty violators thereof to punishment; and that the very existence of life and the preservation of society, imperatively demanded a resort to this high-handed rebellion against the laws of their own enacting and the government of their own choosing.

I recognize no such necessity—I cannot, and will not submit to the doctrine, that, in this country, where the people make the laws and elect their rulers, and where there is provided an easy, safe and practicable mode of correcting the defects of the one, and getting rid of the vices or incompetency of the other, that we are authorized or justified in trampling down with indiscriminate and reckless fury the laws and the constitution of our country—that lawlessness can best effect the observance of law, or unauthorized assumptions of judicial power best promote the ends of public justice, or that power is just as safe in self-constituted, unelected and rebellious rulers, as in those who have assumed it by virtue of the authority, and in strict conformity with the requirements of the law. This Government would cease either to have or deserve a continued existence, if the wisdom and patriotism and blood of its revolutionary founders have all been expended in vain—if they have erected a governmental fabric too weak to support itself, and which the rude hands of an unlicensed mob may destroy at pleasure. I believe that ours is the best and purest and strongest government upon the face of the earth, and so believing, I will never, on all proper occasions, hesitate so to declare, and to denounce as traitors those who for any purpose engage in impious attempts to overthrow it. If I am right in this, and I am sure the farmers of Queens county will be the last to deny it, then an obligation rests upon us all as individuals to lend no

countenance by word or deed—in theory or practice, to the idea that we can safely violate in our persons, the solemn laws of the land. A mob trampling the law under its feet, is only worse than a single individual engaged in the same act, so far as the evil is wider spread and the consequences magnified. The moral wrong of one person willfully setting the law at defiance is just as great so far as he is concerned, as if he were acting as the component part of a treasonable combination of men for the same unholy purpose. I am aware that many of our laws, both State and national, are deemed exceedingly objectionable by large portions of the community—that they are regarded as invidious in their application, and unjust and oppressive in their effects. But the true, legitimate and patriotic mode of getting rid of them is a resort to the constitutional remedy of the ballot box, and the peaceful and conservative instrumentality of the courts, any other resort, even admitting them to be all that their enemies insist, will lead to consequences far worse than can possibly result from a faithful compliance with them. No thinking, fair-minded man but will admit that the observance of bad laws entails not a tithe of the evil upon a community as the rebellion and anarchy which follow their violation. I trust that whatever others may do—whatever politicians may preach—whatever visionary theorists may proclaim, the independent and intelligent farmers of this county will not only inscribe upon their banners; but treasure up in their hearts as something too precious to be trifled with, something only to be lost with life, the patriotic doctrine of *fidelity to law*.

I have said that the remedy of the evil of bad laws was a peaceful resort to the ballot box; and here let me say to you, gentlemen, that whilst I would not have you to be mere politicians, I am free to confess that the duty of exercising the elective franchise is one that ought not to be avoided by you. In this government where the privilege of voting, and the power for good or evil resulting from its exercise, are so extended—where the dishonest schemes of political tricksters may be so easily carried out—in a word, where so intelligent a portion of the voting community as the farmers, have the ability to exercise so controlling an influence in modelling the character of the government and shaping its laws, it does seem to me that this important duty should not, without the most urgent necessity, be neglected by them. There may be times too, and doubtless are, when our farmers should be willing not only to exercise the right of voting, but assume the cares of official station. An office-hunter, is one whom the world, very justly too, in my opinion, is wont to despise. Whilst, then, I would not have you this, I see great propriety in your consenting to accept office, where, in the judgment of your fellows, your efforts therein, may subserve the interests of the State. Look at the illustrious, Cincinnatus, who was called away on three several occasions from his agricultural duties, to be Consul and Dictator of Rome, and whose valuable services to his country, and patriotic determination, when those services could be dispensed with without public detriment, to leave the highest official station for the

less exciting but equally honorable duties of his calling, point him out as a noble example for the farmer of our own times.

These are some of the duties which rest upon you as citizens—do not suppose, that because I omit to mention others, that they are all,—I have only glanced at the more prominent—your own good sense, and earnest desire to meet all the just demands of your position will suggest many others, as the varying circumstances of life shall from time to time, bring them to your notice. “A Citizen of Rome” was the proudest title that could be borne by the sons of that mighty nation. Yet the title of *American Citizen*, by a faithful observance of all the duties which it enjoins, win to itself the same honor, and confer the same distinction upon him who wears it.

There is one more duty, gentlemen, higher than all the rest, of which I can only take a passing notice—the duty you owe to your Creator.

It has been said, “an undevout astronomer is mad.” It was thought that loss of mind only could exist with want of devotion in the case of him who made the starry firmament his study. It was thought that the mind which was permitted to range amongst the heavenly bodies tracing the wondrous mechanism which characterizes their laws and motions, clearly discovering not only the existence of a first Great Cause, but manifold evidence of the wisdom and mercy of the Creator—that the mind which in view of all this, failed to recognize and adore, must be wanting in sanity. Can we not say with equal truth “an undevout agriculturist is mad.” Does not he, like the astronomer, behold the constantly recurring evidences of his Maker’s goodness and greatness. Is he not the daily and hourly recipient of the incomparable blessings of the one, and is he not permitted to behold the unmistakable witnesses of the other? Indeed he can scarcely look upon Nature in any of her various phases, nor behold any of the “wonderful works of God” without seeing the combination of these two attributes of the Creator. The summer heat, and the winter’s cold—the copious shower and the refreshing dew—the simple flower and the waving grass—the fields and the groves with their countless and beautiful varieties—all these proclaim the greatness and goodness of that Almighty Being, by whose will alone they exist, and are made to minister to man’s necessities and pleasures. It has always seemed to me that the country, above all other places, was the peculiar field for the display of the wonders of Creation. “God made the Country” is the offspring of such a sentiment. An uninterested and indifferent looker on in the country cannot but be struck with the truth of this; but oh! how much more forcibly is the reality brought home to the farmer, who both sees and feels that not only an Almighty ruler is constantly making himself manifest in all the workings of power which are taking place around him; but also that a merciful father is wisely and kindly tempering the winds and storms to his wants and wishes, and making all the works and wonders of Nature subservient to his interests. All this the farmer sees, and feels, and realizes. Not a day passes that he does not have cause to own the bounties of a great

benefactor. Has the rain ceased upon the earth for a period? and is the heat of a fervid summer sun parching up the thirsty ground, and withering the crisping corn? An early morning visit to his fields, shows him that a timely and a refreshing dew has opened again the withered blades, and e'er another night has closed in upon the earth, even whilst the glories of the setting sun are most resplendent, a dark cloud is seen looming up in the west—the electric spark, on wires of thought, flashes the welcome intelligence of a coming shower—soon illustrating the truthful beauty of Lord Byron's description of the dying gladiator—

"And his drooped head sinks gradually low,
And through his side the last drops, ebbing slow,
From the red gash, fall heavy, one by one,
Like the first of a thunder shower."

the heavy drops, slowly, indeed, begin to fall; faster and faster they continue to come; and now the thirsty earth has drunk to its surfeit of the refreshing draft. Nature again assumes her cheeriest aspect—corn and grain and grass, as though designed to teach man a lesson of humility, bow down, for the moment, their sunken heads, as if in token of grateful submission to their Maker—then with the strengthening and invigorating rays of the morning sun, again awakening to new life, and holding out to the faithful and hopeful agriculturist the promise of abundant rewards for all his labors.

Does this simple description of one of bounteous Nature's most common scenes come home to you, my friends? and does it not remind you of many similar manifestations in your experience as farmers? Is it not then a matter of wonder? Is it not, indeed, incomprehensible, that those persons, who are thus brought necessarily to such close and constant contemplation of the Creator, through his works, should fail to acknowledge the debt of gratitude they owe him, by rendering him the homage due to his great name, and faithfully discharging the many and various duties springing out of their relations to him?

I will not occupy your time further upon this, lest I may be justly charged with intrenching in an agricultural address upon the rights and privileges of those, whose peculiar province it is to treat of religious matters. But, I trust, in concluding this branch of our subject, you will agree with me in saying that a faithful and industrious farmer is none the less to be esteemed because he is also a pious and exemplary christian.

I sincerely congratulate you, gentlemen, upon the fine specimens of valuable stock of various descriptions, which we see here to-day, and upon the unusually magnificent display of vegetables, grapes and flowers, which, everywhere, in such tempting profusion and with such marked excellence, characterize our present exhibition.

And to woman, too, are we indebted here to-day, (as we are all through life indebted to her, for manifold contributions to our comforts,) for the gratification by her of the most fastidious and refined taste in the charming

specimens of needle-work which are here witnessed, and especially in the workmanship of those fair and expensive fabrics which we see around us. In all the works of art, gentlemen, and all the productions of nature displayed here, we have abundant reasons for pronouncing this one of the most interesting and successful of all our agricultural exhibitions.

Gentlemen, I have now concluded all that I intended saying to you—you perceive that I have not attempted to deliver to you a learned or elaborate address. The remarks I have made have little credit either for originality or novelty. They are exceedingly simple and commonplace. But if they shall serve to direct your thoughts to some practical points in the every day social and moral life of the farmer—something which the world does not sufficiently regard as part of the farmers peculiar concern; if I have done anything, however little, towards making the farmers of my native county more interested in the discharge of their social, civil and religious duties; if I have done aught towards making them better neighbors, better citizens, and better christians, I shall have fully accomplished my purpose.

ADDRESS OF L. CHANDLER BALL,

PRESIDENT OF THE RENSSELAER COUNTY AGRICULTURAL SOCIETY,
DELIVERED AT THE EIGHTEENTH ANNUAL FAIR AND CATTLE SHOW
HELD AT GREENBUSH, NEW YORK, SEPTEMBER 16, 1859.

Ladies and Gentlemen:—

I am obliged by the position in which the society has placed me, to deliver the address on this occasion; having endeavored unsuccessfully to procure a speaker from among the distinguished authors and lecturers of the country—some of whom, recognizing the immortal brotherhood of learning and labor, are happy at this season of ripening fruits and maturing harvests, to greet the husbandman with words of fraternal cheer, and set gems of glowing thought amid the pearly drops that gather upon the brow of toil. Honor to these noble men, who having ascended Pisgah, and seen the promised land, return to guide the sons and daughters of toil out of the wilderness of ignorance and humiliation, and introduce them to the golden fields, where their possessions lie.

The place in which it has been our good fortune to hold this annual festival, is full of historic interest. These grounds, now filled with the products of industry, employed in the peaceful pursuits of agriculture, were once devoted to the purposes of war, and bristled with weapons for human slaughter. Within sight are the highlands of Saratoga, where was fought one of the most important battles of the Revolution—a battle that arrested the march of hostile invaders, and consecrated to liberty the land it was fought to defend.

It is to that victory that we are indebted for the privilege of tilling these fields in peace, and eating our bread in security; that instead of turning our plow-shares into swords and marching up to the harvest of death, our hands hold the implements of husbandry, and gather into bursting garners the fruits of peaceful labor; that instead of the morning drum-beat and the evening gun, birds sing the reveille that invites us to our daily toil, and lowing herds call us to our evening rest.

Grateful though we are to the men who by God's favor achieved our national independence, though earnestly hoping that on every field that human blood enriches, will grow wreaths to deck the brow of freedom—that Magenta and Solferino will be inscribed with Lexington and Bunker Hill on the scroll which liberty exhibits to her followers—we have not assembled here to offer our tribute of praise to the men who have won great victories and achieved imperishable renown upon the battle-field. We are not here

to erect a statue to Mars and pour bloody libations around his smoking altars, but to bind with fresh garlands the brow of Ceres, and exhibit the trophies by which Peace proclaims her victories.

Though the occasion is one for thankfulness and congratulation, though I might dwell with pride upon the achievements of labor, and point with satisfaction to the evidences of taste and skill which these grounds exhibit, I shall indulge in no special laudation of agriculture, nor describe those who work in her service, and live by her bounty, as having reached the summit of earthly felicity.

I shall rather use the point we have gained to ascertain our real progress in the art of husbandry, and discover our relative position among the several *corps d'armee* who are bearing the banners of a higher civilization round the world.

The first thing to be considered in looking at any business, is the means which those engaged in that business possess of prosecuting it with success, and of working out amid its trials and conflicts the happy results of a well-spent life. It is to this thought in its special relation to agriculture, that I propose to devote the half-hour which I shall venture to occupy on this occasion.

Let us see if the farmer possesses the means of prosecuting his business with success, so that all his professional duties shall be promptly performed, the claims of citizenship and of humanity honorably discharged, the demands of learning and religion fully satisfied; so that, after crossing with flying feet the brilliant boundaries of youth, after climbing to those serene heights on which mature and vigorous manhood achieves its triumphs, and records in the world's book of heraldry its honors, he shall go with quiet dignity down the hill of life, and watch with calm delight the glowing sunset that will gild and hallow life's closing day.

Now, gentlemen, you know that I am myself a farmer, sensitive to the reputation, and jealous of the honor of the class to which I belong. What I shall say, therefore, you may be sure is dictated by a sincere desire to benefit those to whom I speak. It is necessary sometimes, however, to present unpleasant truths, which if kindly taken will improve and beautify the human character, as bitter medicines strengthen and establish the human constitution.

Two items make up all the capital employed in business; or I might better say that two partners compose the firm by which the business of the world is performed and conducted—HEAD AND HAND. These should contribute equal amounts to the capital stock, and each invest all its earnings in the execution of God's command, to subdue the earth and exercise dominion over it. In a word, each should be educated up to the highest point of human achievement.

This great truth lies at the foundation of all successful human pursuits. It arrests the farmer at the very threshold of agricultural life—it meets him at the gate, follows him to the field, walks behind the glittering plow-

share, drops with the falling seed, and accompanies the reaper as it gathers the golden harvest.

But in looking at the agricultural population of the country as a class, it is impossible, after according to it, as I cheerfully do, the possession of sterling worth, untiring industry, high morality, and devoted patriotism, it is impossible not to confess that it ignores and overlooks the great truth here announced—the relation of labor to mind. Hand asks no aid of Head, who is only a sleeping partner in the concern. Learning, in its higher signification, forms no part of the farmer's capital. Land, oxen, plow, are obtained; but a knowledge of the principles of agriculture and the laws of organic life, an acquaintance with science and the arts, are overlooked and dispensed with.

While no business in which man can engage, not even the professions of medicine, divinity and law, is more dependent for success upon deep and extensive learning, none has derived so little benefit from the great discoveries and inventions of the age as the business of farming; and while no class of men so much need, from their isolated situation and few social advantages, the refining, liberalizing and ennobling influences of education, none really obtain so little. No persons avail themselves so tardily and so reluctantly of those agents of human progress, which inventive genius and artistic skill have given to the world.

Commerce, manufactures and the mechanic arts are far in advance of agriculture in the extent of their researches, and in the readiness with which they appropriate to useful and beneficent purposes the discoveries and inventions of the age. Merchants, manufacturers and mechanics have a higher appreciation of the power of knowledge, and as a consequence occupy higher positions in society, and obtain more of the world's regard.

Merchants have their libraries, reading rooms, and lecture halls: mechanics have the same, and their evening schools, where, after the labor of the day is ended, after fashioning at the bench or the anvil, and fitting for human uses the brilliant conceptions of genius, they assemble to obtain from books and teachers the information which is indispensable to success and honorable consideration.

Except the county fair, which does not receive half, nor a tenth part of the attention which its importance merits, can you show me the farmers' association for mutual improvement? Do farmers meet at the district school house, the village hall, or other convenient places, for instruction and improvement in agricultural science? Do they even employ at home those hours of leisure which occur in the most laborious life, in reading and study? Every household has means which, to an earnest lover of learning, are alone sufficient for the acquirement of a very respectable education.

Books which contain the accumulated knowledge of sixty centuries burden your library shelves. The great events, the rounds in the giant ladder by which the people have raised themselves from savage to civilized life, are recorded for your instruction. The lives of great men, whose

deeds flood with glory the pathway of nations, are spread out upon the printed page, and invite your perusal. Science, in embroidered robe and starry crown, offers passports to her imperial realms. Poetry, radiant with pearls and gems of unimaginable beauty, solicits your acquaintance. Music, breathing celestial harmonies, unfolds her purple wings and strikes the key note of earth's rejoicing hymn.

Yet all these attractions and advantages fail to induce the farmer to make suitable preparation for the duties of a life cast in the most eventful epoch in the history of the human race. Shield and hamlet hang neglected on the wall—the sword of truth lies rusting in the scabbard—dust covers the trophies of intellectual achievement, and the bugle-call for volunteers to attack the strong holds of ignorance, and plant triumphal banners upon their dismantled towers and broken walls, is unheard, or, if heard, disregarded.

Did the thought ever occur to you, gentlemen, that farmers are more interested in the diffusion of knowledge and in the growth and permanency of free institutions, than any other class? Are you familiar with the fact that farmers everywhere, in all nations and climes, form the substrata of society, which if the sun of liberty and the light of knowledge do not penetrate, if not broken into and permeated by science and the arts, will forever remain like the undisturbed subsoil of your native hills, poor, cold and unprofitable? The farmer, who in all ages has done the least to plant and sustain liberal institutions throughout the world, owes more to liberty and learning than any other class, because they have raised him from a greater depth of suffering and degradation. Under despotic governments, where learning is prohibited to the masses, where the light of freedom only penetrates in fitful gleams, which like the lightning's flash to the sinking mariner, only serves to reveal the horrors of the scene, the condition of the agricultural laborer is miserable in the extreme, and degraded beyond expression. Not where the star of empire gilds with lurid light, crown and sceptre, high raised battlement and moated gate, but where the sun of freedom lights up the walls of learning and the chambers of legislation with its heavenly splendor, is the farmer's mud-walled hovel changed into the neat and cheerful cottage; the abject and crouching serf into the erect and fearless citizen, and invested with the honors which belong to virtuous and independent manhood.

As in civil liberty, so in the arts. Every discovery and invention, every improvement in machinery, every addition to the means of travel and transportation, and the transmission of intelligence, are of greater importance to the farmer than to any other class; because they tend to distribute and equalize the elements of wealth and power, of civilization and refinement, and to place him on an equality, social, political and intellectual, with the people who dwell in the great centres of business and of population. Let learning cease among the people, let knowledge die out among the masses, liberty would at once be dethroned—the stars and stripes, the flag “by angel hands to valor given,” would be the winding sheet of freedom. Then

wealth and power would be seized by a few—the laborers of the nation would be the first and greatest sufferers, and the tillers of the soil would be reduced to their old condition of hereditary serfs and bondsmen.

These are the mighty truths which the farmer ignores and overlooks, while he permits the world's harvest of knowledge to be gathered by a few, to be retailed to needy applicants at usurer's prices, or thrown out to starving beggars, like crumbs from the rich man's table.

The consequence of this inattention to intellectual wants is, that farmers as a class not only do not possess the means of prosecuting their business with success, but they fail to represent in their own lives and characters the intelligence and the inspiration of the age in which they live.

In this age of progress, the man who stands still a single day will be left behind in the grand march of human improvement. The people, I do verily believe, have taken their final exodus from the bondage of ignorance and error, and with priest and prophet, with fire and cloud, are pushing on through wilderness and sea, to take possession of that glorious heritage which they hold by promise.

More has been achieved during the present century than had been obtained before since the first feeble rays of intellectual light broke in upon the dark ages of the world. The rapid strides which science has made within the last few years, the perfection to which art has reached, the intellectual activity of the people, who like an invading army, nightly bivouac on the battle-field, with sentinels posted and watch-fires burning, and with the first glistening of the sun on shield and banner, move on to another and greater victory—these, while they strike the mind with wonder and admiration, fill the heart with thanksgiving, and open the mouth with praise.

It is easy to see that in an age so prolific in useful discoveries, so fruitful in inventions adapted to the business of life, to lessen its burdens, increase its profits, and multiply its pleasures, education cannot possibly be overlooked. I don't mean that education only which is obtained in the school room, but that enlarged and comprehensive training which consists in acquiring habits of neatness, order, and useful employment; in establishing principles of truth, justice, and honor; obedience to law, and a just regard for the conventional rules of polite social intercourse; a correct estimate of one's own character, and a clear perception of the position one has a right to take, and is qualified to maintain; a watchful eye to the discoveries of genius, and a prompt application of all useful inventions to the business and the elevating enjoyments of life—this, added to that acquaintance with science and the arts which it is the peculiar province of the schools to teach, is the kind and amount of education which every American citizen, be he farmer, merchant, manufacturer, or artisan, is bound to obtain.

There can never be any considerable space between the great body of the people and the educated men of the country, without endangering all the cherished institutions of civilized and christian life. The further,

therefore, that genius and learning penetrate the mysteries of nature, and unfold the principles of eternal truth and justice, the more imperative is the duty, and the more absolute the necessity for the people to press up and secure and make forever their own, the knowledge that has been thus obtained. Don't let the great truths of philosophy and science, the wonderful creations of art, remain the exclusive property of the discoverer and inventor; but make yourselves the depositaries of all the important facts which genius and skill have acquired, and use them to improve and extend your business, to educate and ennoble yourselves, and enrich and exalt the nation. Until this is done, until the farmer obtains an amount of information adequate to the highest demands of this progressive age, he will not possess the means of securing that pecuniary independence, which is one of the necessary adjuncts of free citizenship, and he will also fail to reach that elevated social position wherein man's best and highest powers are developed and exercised, and the happiest results of a well-spent life worked out.

There is a physiological fact connected with this subject of learning, which is worthy of your consideration. An educated man, all else equal, can perform a greater amount of labor, work more hours, produce greater results, and resist longer the antagonist forces of nature, than an ignorant, uneducated man. If you examine the subject, you will find that the history of all great enterprises, all difficult and hazardous undertakings demonstrate this fact.

It was observed in the Mexican war, that in acts of bravery, in the performance of those heroic deeds which required unusual and long continued bodily exertion, the West Point Cadets bore the palm. The exploring expeditions of Lieut. Strain, in the wilderness of tropical America, of Colonel Fremont among the desolate gorges of the Rocky Mountains, and of Dr. Kane amid the eternal snows of the Polar circle, where the physical powers of the men were tasked to the utmost limit of human endurance, show the same result—that upon the educated men of the parties, who performed the greatest amount of labor, and preserved the most buoyant and hopeful spirits, the safety of the expeditions depended.

The fact might be stated still stronger. Persons of feeble constitution and poor health, confirmed invalids, have by the mere force of education, high mental discipline, performed valorous deeds, and exhibited bodily powers, such as belong to the very Anaks of the race. William of Orange, afterward King of England, and the French Duke of Luxembourg, are examples; both had weak, sickly constitutions—both were enfeebled by disease, and racked by cruel pains. Macaulay, describing a terrible battle in which these two sickly beings were opposing commanders, says that “among the hundred and twenty thousand soldiers marshalled around Neerwinden, under all the standards of Western Europe, the two feeblest in body were the hunchbacked dwarf who urged on the fiery onset of France, and the asthmatic skeleton who covered the slow retreat of England.”

... If education can produce such effects as these, if learning can increase

the vigor of the body, and so exalt the powers of life as to overcome pain, sickness and disease, is it not worthy the attention of the farmer, whose whole life is one of toil and exposure? If the farmer knew that he could use with more effect the shovel and the hoe, remain longer at the plow and in the harvest field, and endure with less danger the summer's sun and winter's storm, by being educated, he would doubtless bestow more labor upon the cultivation of the mind, and give a more liberal support to institutions of learning. And if boys knew and appreciated this fact, that learning quickens, concentrates and strengthens man's bodily powers, that it does really send the blood along its crimson channels in swifter currents, and returns it in fuller volumes to renovate and exalt the powers of life, they might perhaps devote to the lofty purpose of education, those hours which are now spent in hanging about taverns and street corners, in driving fast horses, and in urging to a more vigorous growth the vices and base passions of their nature.

Yet such is the fact: the boy who learns most can do most—the boy who leads his class in the school room, will lead his fellow men in the battle of life, whether that battle is fought with the pen, the bayonet or the plow.

Learning is a diamond in the crown of labor; not placed for ornament alone, but to shed effulgent light around the footsteps of toil, and draw from the soil of humanity those choicer fruits and larger crops, which, after perfuming the earth with fragrance, will be gathered by the Divine Husbandman, presented at the last great Exhibition, and receive premiums in Heaven.

The education of which I have spoken relates exclusively to the head, and is not simply nor mainly to enable its possessor to superintend and direct the labor of others, but to make more perfect and complete the work of his own hands. These, therefore, must be educated and trained, and compelled to perform their part in producing those grand results which mark the progressive movements of the race.

Manual skill and dexterity must be acquired,—habits of industry fixed,—regular, continuous, effective labor performed. Too many men, and especially young men, attempt to evade that universal law, which makes wealth depend upon labor, and endeavor to obtain riches by other and ignoble means; by that shrewdness which entraps the credulous and the unwary; by sharp bargains and cunning devices; by practicing the unworthy arts of the speculator, whose hands were never hardened by contact with the implements of toil, whose brow was never moistened by the sweat of honest labor. Some crowd into those avenues which should be exclusively devoted to females; and though formed to wield the axe, hold the plow and swing the flail, are ambitious to measure tape and sell laces. Some refuse to work and provide the necessities and comforts of life, on the arrogant assumption that the world owes them a living.

The world owes no man a living but those whose sublime deeds have benefited the world, and whose modesty prevents them from claiming their great reward. All we can justly claim, or have a right to receive, is the

fruit of our own labor—that which our own hands have made, or our own brains wrought out.

But nothing is denied to faithful, intelligent, well directed labor. It is the “open sesame” to nature’s profoundest secrets, and earth’s richest treasures. Power and dominion wait upon it, and higher honors than were ever paid to royalty and its costly pageants. The time has passed when idleness, whatever its rank and lineage, can take precedence of the sons of toil. The age of chivalry, of pastoral indolence, and fairy legend, has gone by. The pomp and glory of the Crusaders, the renown of the victor at the Olympic games or gladiatorial combat, the shout that welcomed war’s conquering hero home, and gave him a niche in the temple of the Gods—these, with the tilt and tournament and gay song of the troubadour, have all passed away with the times that gave them birth, and it has become the settled conviction of the present age, that to be pre-eminently great, it is necessary to be pre-eminently useful.

Though this is an age of high intellectual development; though learning and refinement gild the rougher features of life, and shed a golden lustre round the brow of toil, it is no less the age of plain, practical, calculating industry; having definite aims, and producing positive and beneficial results. The column that art rears and genius decorates, must rest on solid foundations, and form a necessary support to the structure it adorns. The principle of utility has at length come to be recognized as embraced in that divine injunction, “Six days shalt thou labor.”

The noblemen of this age, therefore, are those who use to the fullest extent and for useful purposes, all the powers of body and mind with which God has endowed them. No herald’s college can confer a better patent of nobility than this—no stars or ribbons on brodered garment worn, no device emblazoned on panel, cup or shield, give higher evidence of greatness than labor writes upon the manly form and open brow of its sincere and intelligent followers.

This is that high order of physical training, that education of the hand, which should accompany and be joined to the learning of the head, and complete that character for persevering effort and successful achievement, which belongs in an eminent degree to the American citizen. Though the farmer may obtain all the information that books can give, and leave the halls of learning crowned with collegiate honors, yet if he has not graduated in the field and obtained a diploma from nature, if he has not performed the labor necessary to familiarize himself with all the operations of husbandry, to give health to the body, strength to the muscle, skill to the hand, and confidence in the success of manly effort, he lacks one of the indispensable elements of agricultural success; for only by a union of the greatest skill of the hand, with the highest powers of the head, can success, complete and satisfactory, be obtained, and those sublime results which crown a life of useful labor be secured.

There are, doubtless, a few individuals in the country who possess in an eminent degree these qualifications. But these stand like Saul among the

Israelites, head and shoulders above the class they are supposed to represent; while we are obliged to acknowledge that the great mass of farmers have not sufficiently educated either the head or the hand, and consequently do not possess the means of prosecuting their business with success, nor of working out amid its trials and conflicts, the happy results of a well-spent life.

It has not been my intention to attempt to instruct the farmer in the special duties of his profession; but if I should venture to name any act of farming, to which knowledge and skill can be applied with more profit than to any other, it would be the treatment of the soil, which is impoverished and worn out by ignorant and unskillful management.

There was once a peasant who owned a goose, that every day laid a golden egg. This small supply of gold was sufficient for the daily wants of the peasant and his family, and their only care was to preserve the life of the remarkable animal from which they derived their support. But at length the peasant, stimulated by unnatural desire, required more gold, and unwilling to wait the tardy operations of nature, cut open the body of the goose to obtain the coveted treasure, and thereby killed the animal and lost his means of support.

The soil is the goose that annually deposits a golden egg in the lap of the farmer. While properly fed and tended, this operation will not cease; as years roll on, true to the appointed hour, it will pay its annual tribute down; age will not dim its plumage, nor diminish its productive power, for it contains within itself the elements of unfading beauty and immortal youth.

But there are some farmers who, like the peasant in the fable, are in haste to grow rich; and in their attempts to anticipate the rewards that follow patient toil, in their efforts to grasp to-day the wealth that belongs to and is necessary to the enjoyment of to-morrow, destroy the means by which that wealth is obtained—they starve and kill the goose that laid the golden egg.

If the soil is neglected, overtasked or otherwise improperly treated, in vain will be the labor of the husbandman; the sun may warm, the air permeate, and the dews of heaven moisten, and yet no increase will reward the farmer's toil—no golden harvest crown the year.

The preparation and management of the soil are points upon which farmers are most deficient. Notwithstanding man has been laboring upon, and drawing his support from, the soil ever since he was driven from the garden which God planted, yet he is at this moment, with few exceptions, as ignorant of its origin, composition, capacity, and the means necessary to be used for its renovation, as he was on that day when, with a crooked limb for a plow, and a sharpened stick for a spade, he first attempted, mid thorns and thistles, and in the sweat of his face, to draw his support from the bosom of his mother earth.

This fact is proved by the vast quantity of deteriorated land which is left to recover, by the unassisted operations of nature, its former fertility.

Man annually records upon the soil he cultivates, the evidence that is to establish his power to subdue, and his claim to hold dominion over the earth and its lower forms of animal life; or in crooked lines and misshapen characters he furnishes testimony to convict himself of disobedience to the divine command, and cut him off from among the inheritors of the promise.

The difference in fertility between lands in a state of nature and those which have been brought under the plow, should be largely in favor of the latter; nevertheless the contrary is the fact.* In the older portions of the country, it is not uncommon to witness the abandonment of farms once rich in all the elements of fertility, and yielding to the husbandman an annual tribute of sixty and a hundred fold, now impoverished, worn out, incapable of supplying the necessities of life to those who were born upon it, or whose stalwart arms reclaimed it from the wilderness and the savage. These worn out lands are sold for any sum they will bring, and a new home obtained in a new State, where the glittering plow-share has not penetrated, nor the song of the reapers been heard.

Here, while those substances which nature during long ages had prepared for the support of vegetable life last, the new home puts on the appearance of comfort and substantial prosperity—grass clothes the meadows, grain waves in the breeze, fruits load the orchard.

But one after another the ingredients required to produce these results, to clothe the fields with herbage, and fill the barns with grain, disappear from the soil. Crops dwindle, orchards decay, animals deteriorate; and before the forest is fairly removed, or the tough soil of the prairie completely subdued, the farm presents the old picture of poverty and dilapidation.

That man's occupancy of the soil should be followed by deterioration and loss, is opposed to the laws of organic life, and the object of man's creation. The power to conquer and subdue includes the duty to enrich,

* The following table in some measure shows the falling off that has taken place within a period of ten years in the annual yield of wheat in several of the states:

	1840.	1850.
The number of bushels produced was, in		
Connecticut.....	87,000	41,000
Massachusetts.....	157,923	31,211
Rhode Island.....	3,098	49
New Hampshire.....	422,124	185,658
Maine.....	848,166	269,259
Vermont.....	495,800	535,955
Tennessee.....	4,569,692	1,616,356
Kentucky.....	4,803,162	2,142,822
Georgia.....	1,801,830	1,088,534
Alabama.....	838,052	294,044
Sum total.....	14,026,847	6,204,918

These figures show pretty conclusively that in all parts of the Union the land must have been deprived of some of its most essential elements, and that its fertility is constantly on the decrease. There can be no doubt but that three-fourths of the arable soil of the Union are undergoing, to a greater or less degree, this exhaustion process.

to improve, to bless. Otherwise the possession of power would be an evil and a curse. Man's conquering march over the earth should be conducted by science, accompanied by the arts, and marked by annual ovations to Ceres, whose blooming garland and golden cornucopia diffuse fragrance and scatter plenty over the land.

It could not have been the design of the Creator that the soil should ever become exhausted of its fruit and grain-producing qualities, nor that the introduction of the human race should violate the laws of life, and disturb the balance of organic nature. Provision has been made for the preservation of all the substances which compose the earth, and the plants and animals it contains. In fact, no atom of matter is or ever can be destroyed. Though earth, and air and water, under the direction of the Great Designer, are constantly entering into new combinations, and building up new bodies, now forming the tender herb that a single frost destroys, now building the oak that braves the storms of a thousand winters, now composing the flower whose breath lends fragrance to the gale, now forming the fruits and grains which human hands tend and garner; yet in the countless forms in which matter is exhibited, it is not fixed for a single moment. Built into forms which appear solid and indestructible, yet appointed agents are unceasingly at work, liberating from rock and ore, from plant and animal, the ingredients of which they are composed. These are converted into their original elements, and return to that exhaustless reservoir from whence the materials of all earthly bodies are drawn.

A few substances, barely a dozen in number, contained in the earth and in the air, unite in the vegetable and form starch, sugar, gluten, oil, &c., &c., these consumed by animals are converted into blood, muscle, bone. But the animal cannot retain for a single moment possession of the substances of which its body is composed; it is compelled by the laws of its being to give up and restore to the earth and the air, all the materials it has consumed.

But you will observe that these dozen substances removed from the soil by cultivation, must be restored to the particular fields from whence they were taken, or else those fields will become exhausted, and fail to yield remunerative crops. Every ton of hay, every bushel of roots or grain, every animal taken from the farm, removes a portion of those ingredients upon which its fertility depends, and enriches the district in which they are consumed. Though the elements of fertility are always the same, and cannot be diminished, yet they may be so distributed and appropriated, that while one farm or district is clothed with verdure and enriched by bountiful harvests, another may be stripped of its gorgeous vesture, despoiled of its wealth, and left to exhibit in barrenness and dilapidation, the ignorance and folly of its owners.

The soil must be kept in a high state of fertility by restoring to it all its annual loss by tillage, and by putting it in such a mechanical condition as regards depth, lightness, and permeability, as will allow the fertilizing ingredients it contains to enter freely into the growing crop.

This leads me to add that drainage and irrigation are subjects of such great importance that they cannot be much longer overlooked by the intelligent farmer. Water forms a very large portion of all organized bodies, and is the chief element in causing fertility; I mean that however complete may be the number, and however large the quantity of other ingredients, they would without water be entirely useless for the wants of vegetation. Where water is absent vegetation dies; where it exists in excess, useful plants and grasses disappear. This is sufficient to show that water should be supplied to the soil in definite proportions, to be regulated by the wants of the growing crop. If there is an excess, it must be removed; if a deficiency, it must be supplied.

Another subject of great practical importance, is the cultivation of grasses, both for pasturage and for winter forage. At present, the farmer relies principally upon such grasses as he finds growing naturally in his fields, without reference to their nutritive qualities, or the season of their maturity. The result is that in early spring, the pastures are nearly destitute of herbage, and in mid-summer are thinly covered with hard, dry, innutritious plants, which do not give sufficient nourishment to the flocks and herds that are expected to live and fatten upon them. Successive crops of sweet, wholesome, and nutritious grass, adapted to different seasons, and reaching from early spring to the killing frosts of autumn, would enable the farmer to increase his stock of sheep and cattle, and render them more valuable for the uses to which they are put. Such crops may be grown at small cost, and will double the value of any farm on which they are systematically introduced. Other subjects, if time would permit, might be mentioned. Nearly all the details of farming are important, and might with great benefit receive your attention. There is probably no department of husbandry, whether it relates to the soil, the plant, or the animal, which is not susceptible of great improvement, both in its manual operations, and in the principles upon which the necessary labor is conducted. It would be strange if it were not so. Agriculture was not born, as many seem to suppose, like Minerva, full grown and armed for conquest. Like every other business, it has advanced from rude and imperfect beginnings to its present condition; which, though not one for much self-laudation, is nevertheless in some degree creditable to those engaged in it, and indicative of that complete and crowning victory which it is destined to achieve. Though at present somewhat behind other institutions in the skill and knowledge with which its operations are conducted, yet this position is unnatural and temporary; for when farmers display the same zeal that characterizes men engaged in other professions, the same patient investigation, the same earnest seeking after higher truths and better modes, and the same willingness to be instructed, then agriculture will be placed in advance of every other institution as an agent for the extension of knowledge, the spread of liberal principles, and the subjugation of the world to the influences of enlightened christian civilization.

Whenever I have had the honor of addressing my brother farmers, I have embraced the opportunity to inculcate a taste and love for the beautiful, both in nature and in art; believing that where this taste and love exist, they will be exhibited in a better system of cultivation, more comfortable and happier modes of living; in increased means of enjoyment, and a more rational use of the blessings which God has spread over the earth,—a more pleasing personal demeanor, higher graces of speech and manner, and a more correct performance of all social and christian duties.

I beg leave to introduce the subject to *your* notice, as one of great practical importance, affecting the value of property and the habits of the people.

Let the farmer increase the natural beauties of his farm by suitable ornamentation—let him adorn and embellish his house and grounds—let him have genial intercourse with his fellow men, and practice in their presence the highest forms of politeness and good breeding. Let him build neat school-houses, that shall give visible expression to pure and lofty thought—let him erect beautiful churches, and incorporate into their walls and towers and rising spires, the spirit of piety and devotion. If this was a proper occasion, and time would permit, I could demonstrate that a small, dirty school-house, and a homely, ill-constructed church edifice, instead of being what such buildings ought to be, objects of taste and beauty, and helpers in the great work of human improvement, are positive injuries to society; because they lower and degrade and bring down to the level of animal desires and brutish instincts, the exalted idea of human intelligence, and the holy sentiment of religious hope and trust.

It is not without a purpose that learning has been represented to us under forms of transcendent beauty, with her seats fixed in pleasant places, by the side of sparkling fountains, and amid groves garlanded with roses and amaranth. It is not without a purpose that religion has been invested with pure and shining robes, crowned with glory, and with golden harp, filling the courts of Heaven with praise. It is not without a purpose that the earth has been beautifully formed and gorgeously appareled—diversified with hill and plain, mountain and valley, forest and prairie, lake and river, and singing brook—arrayed in robes of more than royal magnificence, forever changing, yet forever new, perfumed with the spices of Araby, jeweled with dew drops brighter than the gems of Golconda, and performing its majestic revolutions in company with ten thousand glorious orbs,—

“Forever singing as they shine,
The hand that made us is divine.”

Physical beauty is a power in the world before which the highest human intelligence bows in homage. Goodness has superior charms, virtue stronger attractions, and wisdom greater power when moulded into forms of beauty, and draped in the flowing robes of elegance and grace.

For this reason, because it is one of the essential elements of power, let the farmer cultivate and acquire a taste and love for all the bright and beautiful things of earth. Let him build handsome dwellings, neat school-

houses and beautiful churches; let him adorn and embellish the field and the road side; let him multiply objects of grace and beauty, until the whole land glows and brightens in the light of a pure and exalted taste.

Then will his fields put on a richer vesture, and yield a more abundant harvest. Then will finer flocks and better herds feed in his pastures and lie in the shade of his woods and groves. Then will blither songs and words of loftier cheer mingle with the sounds of labor. Cords of sympathy will unite in one electric circle, whose continuity will never cease, the industry, the genius and the skill of all nations. Then the unity of the world's great Army of Occupation will be declared, the claims of universal brotherhood recognized, and humanity achieve its last and greatest triumph.

Previous to the delivery of the foregoing Address, a selected choir of ladies and gentlemen sung the following original ode, written for the occasion by Mrs. L. H. SIGOURNEY, America's favorite poetess:

ODE FOR THE AGRICULTURAL EXHIBITION OF RENSSELAER COUNTY.

When Man was in his pristine strength,
Unstain'd, unfallen, undismayed,
His Maker gave a genial task,
To dress and keep the garden glade.

Then angels deign'd his guests to be,
By sinless Eden's crystal springs,
And oft at hush of day he heard
The hovering of celestial wings.

E'en now, though thorns and thistles claim
Dominion o'er the uncultur'd soil,
From Nature and from God he finds
A blessing on his rural toil.

Earth is his friend, and freely yields
The treasures of her fruitful breast,
And Industry, the nurse of health,
Sheds sweetness o'er his nightly rest.

No sword of flame, no guarded gate
Excludes him from his home of love;
But Peace and Hope, like angels wait,
And point to Paradise above.

His Excellency, Gov. E. D. MORGAN, having arrived upon the Fair Grounds, was escorted by the officers of the society to the President's stand, where he was welcomed by the President, Mr. BALL, in the following remarks:

GOVERNOR MORGAN: I am very happy to meet you on the Fair Grounds of this Society; amid these implements of our art and surrounded by the trophies we have won from field and orchard and garden, from stall and pasture, which proclaim the certainty with which bounteous Mother Earth rewards her skillful and industrious children. You, sir, have gained a fortune, and won a distinguished name in another and broader field of labor, in which talent, industry and perseverance reach their highest development; yet you must have observed that the springs of commercial pros-

perity rise far away from the great centers of business. Like the rills that feed brook and river and fill the ocean, they rise deep in the country ; amid the fields, along the slopes and on the mountain side, where the patient husbandman performs his daily toil, and converts by nature's subtle alchemy, soil and air, sunlight and dew, into fine sheep and fat cattle ; into luscious fruit and yellow grain. But if Agriculture is the parent of Trade and Commerce, these hardy children have not failed in love and duty to their common mother. While Trade, with busy hands, fills up the deficiencies of one district from the surplus of another, and equalizes the means of human subsistence, Commerce, spreading her adventurous sails, and kindling her gleaming fires, crosses the ocean, ascends rivers, explores the earth from the tropics to the poles, for spoils to weave into the robe of Agriculture, and braid among her golden tresses. We acknowledge with gratitude the obligations of the world to Trade, to Commerce, to Manufactures, and the Mechanic Arts ; and we intend to compete with them for the prize which will henceforth be awarded in blessings upon that department of labor, that does most to develop the arts of peace, extend Christian civilization, and increase the happiness of man. Every exhibition that represents the industry of the district in which it is held, must be interesting ; because it shows the progress and relative position of the people, and the condition of those arts that belong to the higher developments of civilized life. In the examination which I invite your Excellency to make of this Exhibition, I hope you will find that Rensselaer is not behind her sister counties, in the extent and variety of her productions, nor in her contributions to the substantial prosperity of the State and Nation.

Gov. MORGAN replied in the following very sensible and well delivered remarks :

MR. PRESIDENT : It is my agreeable duty to acknowledge the cordial and kind manner in which you have welcomed me to the Rensselaer County Fair. I esteem it both a privilege and a high honor to be present upon this occasion, to listen to your address, and to examine these implements of art and these trophies won by the good people of Rensselaer, from "field and orchard and garden, from stall and pasture." You have alluded to the fact that my occupation has been other than that of agriculture, and have been pleased to say that I have occupied a somewhat broader field in the pursuit to which I have devoted the most of my life. It is true that for many years I have been engaged extensively in commercial pursuits ; but I have been a farmer also—not a mere theorizer, but a genuine, practical, hard-working farmer—(applause)—during my youth, and what we learn in our youth, we are not apt to forget. I think I can safely assert that there is not and never has been, a man in the country—and I say it for the encouragement of young men—who worked harder and had fewer privileges, both of time and money, than I had prior to my seventeenth year ; and if, as remarked, I have attained any measure of success in life, I owe it all to the principles inculcated and the habits formed on my father's farm. (Applause). There is no occupation more necessary, useful or

honorable, and none more neglected, than the cultivation of the soil ; and it is very much to be deplored that so many young men leave the country for a clerkship or a profession in the city, not more than one in an hundred of whom are successful, and whose time and labors are but poorly requited in the pursuits they follow, when the same expenditure in the more moral and healthful calling of the farmer would have secured them an abundant reward. I thank you for your indulgence and for the invitation to visit your exhibition.

The exercises closed by the singing of the following hymn, written by Rev. JOHN PIERPONT, D. D. :

AGRICULTURAL HYMN.

To God, the gracious Giver,
Of sunshine, dew and rain,
Of hill-side, vale and river,
And broad and fertile plain—
Who giveth to our mountains
The glory of their trees,
And poureth out the fountains
That fill our inland seas.

Who wrappeth Winter's bosom
In His soft, wooly snows,
And openeth every blossom
That Spring around us throws,—
To Him, our tribute bringing,
Of thankful hearts, we come,
With joy and gladness singing
Our hymn of " Harvest Home."

Shall we, Thy sons and daughters,
Withhold our grateful lays,
While all Thy winds and waters
Are vocal in Thy praise ?
No ! while all earth rejoices
In Thy parental care,
Will we lift up our voices,
Oh God, in praise and prayer.

God, who our patient labor
With plenty crown'st thus,
Help us our suffering neighbor
To bless, as Thou do'st us ;
And while Thy gifts we gather,
From field and fold and stall,
So serve the good All-Father,
Who giveth all to all.

ADDRESS

DELIVERED BEFORE THE GREENE COUNTY AGRICULTURAL SOCIETY,
THURSDAY, SEPTEMBER 29TH, 1859.

By REV. HENRY J. FOX, of the Ashland Collegiate Institute.

Mr. President, and Members of the Greene Co. Agricultural Society:

It may appear strange to some of you, I doubt not, that one who might be supposed to be more familiar with creeds and dogmas, than with fattening Devons; with the black-board signs of plus and minus, than subsoil plowing, roots, and muck, should address you on a subject which none can illumine, or even understand, who has not solved, in part, at least, its mysteries by personal contacts with plow and soil.

To remove this surprise, and entitle myself to the confidence of that portion of this assembly, for whose especial benefit these annual gatherings are held, I may be permitted to say, that I do not stand here to-day as a theologian to demonstrate from nature the existence of a God, nor as a scholar, to startle you with geological and chemical speculations; nor yet as a poet, to go into heroics over gorgeous sunsets, painted butterflies, and diamond dew. I do not appear before you as an orator to entrance you with eloquent prelections on the antiquity, sublimity, and independence of a calling which, as you well know but too often allies us to disappointment and toil. I address you to-day as one to whom agriculture is not a pastime, but a pursuit to which my circumstances have induced if not compelled me to devote careful thought and toilsome effort. I do not address you to-day as an *amateur* farmer, who has been not inaptly described by an ex-president of the State society, as a man "who buys his cattle by the picture; who hires six men to do one man's labor, and who goes out at ten o'clock to see if his men have been up at five:" nor as a *gentleman* farmer, who obtains five hundred dollars, worth of crops at an expense of three times that amount, but I stand before you as a *practical* man, who can see no advantage in that system of farming which fails in making such a return for my investment in thought and labor as shall supply those who are immediately dependent upon me with all the comforts, and some of the elegancies of life, and as shall add to the comfort, refinement and material wealth of mankind at large.

Before I state the particular direction my thoughts are to take to-day, allow me to congratulate the farming community, and not them only, but my fellow citizens at large, on the season of prosperity with which divine Providence has so kindly favored us, and which we bring to a close by this

appropriate agricultural jubilee. Our spring was probably one of the most dark and discouraging that this generation has ever seen. When May and June, and even July, brought with them not so much flowers and birds, and sunny skies, as chilling winds and biting frosts. When the mail and the telegraph informed us that these unseasonable visitations were not confined to our mountain towns, but that from the Connecticut at the East, to the Ohio at the West; from the great lakes, to the Atlantic sea-board, not only the exotics and cereals, but our hardy forest trees, were shrivelled and cut down as by the breath of the Simoon, or the licking tongue of some invisible and stealthy conflagration. We looked at each other in astonishment, and uttered dark prophesying of scarcity, of low prices for cattle, of high prices for grass and for grain, and to some, more desponding than others, it seemed as though famine might stalk through portions of our land, and the toiling masses be visited with "cleanness of teeth." How signally have all these gloomy forebodings and doleful prophesyings come to naught, as though to rebuke and laugh at our distrust of Him, who said on Arrarat, with all the solemn tokens of a covenant, "Seed time and harvest, summer and winter, shall not fail." We end the year with mutual wonderings at the vastness of our ingatherings. Hay, of which, according to these prophets of ill, there was to be little or none, is more than an average crop. Corn, which could never have time to ripen, is now bursting its husk with its golden treasure. And there is hardly a barn in the land, belonging to the enterprising and thrifty, that is not but too small for the treasures which your trembling wagons have brought to their inviting doors. Nay, the very visitation that we so much deprecated, was doubtless designed by an all-wise Providence, to execute a task which man with all his ingenuity has hitherto failed to perform. It is patent to every practical agriculturist, that there has been for years a great and an alarming increase of insect life. The midge, the weevil, the curculio, and that nameless insect which has come so near robbing us of that most valuable of all esculents—the potato—have, we believe, by the severities of the season been, to a very great extent, cut off. No farmer can fail to have observed, the diminution of every species of noisy insect that have for years infested our trees and meadows. Some years ago I gave special attention to that mysterious vegetable disease called the potato rot. I came to a conclusion with regard to it, which was perfectly satisfactory to myself. I observed that on low and moist soil, and sometimes even upon our uplands, immediately after a warm shower there arose from the earth a fly or bug, about the size of the yellow bug, that infests our early vines; that this insect stung the youngest leaves which immediately began to droop; that this sting seemed to beget a disease in the enveloping membrane of the plant which spread down the stalk until it reached the tuber, which it attacked and ultimately destroyed. This year I have failed to discover one in several acres; and if on harvesting the crop it is found to be perfectly sound, I shall regard it as conclusive evidence of the cause and character of the disease. I have named this

only as an illustration. As it has been with that insect, so it has doubtless been with many others. The frost which we supposed came to desolate, has actually in this wholesale destruction of parasitical life, proved a blessing. Allow me now after these allusions to the circumstances which have brought us together, and to those by which the season has been distinguished from others that have preceded it, to state the subject on which I proposed employing the time usually devoted on these occasions to a public address.

Your attention is invited to—*Agriculture as a NECESSITY, as an AMUSEMENT and as an ART.*

There can be no doubt, I apprehend, as to what was the primitive employment of man. It has been eloquently affirmed, that "Before the heaving bellows had urged the furnace, before the hammer had struck upon an anvil, before the gleaming waters had flashed from an oar, before trade had hung up its scales, or gauged its measures, the culture of the soil began." "While it may not, perhaps," as a late writer has said with equal eloquence, "correspond in importance with some other agencies as a *civilizer*, such as commerce, education &c., it has ever been, the pioneer as it must ever be the substantial basis of all civilization; while there may be other agencies in the field at the present time, more commanding, more efficient for reducing all the conflicting elements which go to make up humanity to one homogeneous mass, to living and beautiful forms, it constitutes the great *regulative* element, without which even the latter could never be successfully directed or employed. It may be in this respect but the lumbering stage coach, or pedestrian mail-carrier, compared with the lightning express train and telegraph; yet like the former, at once primitive and cumbersome, it will still doubtless remain the chief dependence of mankind, when the latter institutions shall be known only as things that were."

"But again, there have been disputes as to whether the labor involved in agricultural pursuits is a blessing or a curse. There can be no diversity of opinion, however, I think, as to its necessity. We have wants—physical wants that can only be supplied by the products of the earth. We must plant, and prune, and gather: we must plow, and weave, and build, or nakedness and starvation will be our doom. Agriculture, therefore, is one of the prime necessities of our being. In this view of our relation to the soil, and our dependence upon it for subsistence from day to day, there are certain duties which are ever pressing upon us, and which I must not be deterred from adverting to, because of their homely and unpoetical character. It is the Farmer that controls, and that is responsible for the efficiency of the commissariat (flour and pork barrel) of the human race. He fills and keeps the keys of our world's granary. Years of plenty are the reward of his exertion, and as a recompense for his short-sightedness and lack of effort, famine and pestilence devastate the land. Among those duties growing out of the relation which the agriculturist sustains to the world at large, I would name first: *The husbanding of all the fertilizing agents under his control, and the seeking out, if not the creation*

of new ones. It is a remarkable fact that those things with which we stimulate the soil, and on which the increase of its productiveness depends, are those which we can the most easily command and control. We have a striking illustration of this in the abundance and fertilizing power of water. *Pure* water, such as the chemist might obtain by burning a gallon of hydrogen in a half gallon of oxygen, is a simple, inert, colorless fluid, and excepting in some mechanical way, it would be hard to suppose that its influence could be important or lasting; we ought never to forget, however, in what a large proportion this element is found in all vegetable and even animal substances. It hardly seems credible that the plaster Napoleon or Washington, which the Italian pedler brought to your door, and which graces your mantle-shelf or hall, is at least one-fourth water. Yet such is the fact; the water is there, but solidified. You buy, as you suppose, of some honest dealer, one hundred pounds of alum, or of carbonate of soda, or of soap, and I startle you when I tell you that forty-five pounds of the first, sixty-four pounds of the second, and no less than seventy-three and a half of the last are water. When I tell you that potatoes contain seventy-five per cent, turnips no less than ninety per cent of water, that a beef-steak, if pressed between blotting-paper, yields nearly four-fifths of its weight of that fluid; and that of the human frame, bones included, only one-fourth is solid matter; you will see the importance of this element in the economy of nature, and the impossibility of success crowning any effort in which it may be forgotten or ignored. Simple water, by supplying the the living organism with one of its prime constituents, and perhaps also by its mechanical forces, is a great promoter of the growth of both animals and plants. It is seldom, however, that water comes in contact with the soil in a pure state. It is generally laden with salts in solution, and with organic matter. The rain that comes from the summer-cloud gathers up in its passage to the earth all the precious fertilizing atoms that float in the air. And the little rill, as it spreads itself over our meadows, leaves at every rootlet the decomposed riches of forest and flock. To make water available in the enriching of the soil, however, there must be an exercise of both judgment and skill. It is an easy matter to flood a meadow; but to flood merely may be to drown. We have only to raise the water an inch above the rich vegetable surface, and allow it to stand there for a few suns, and we have created a souring, fermenting, fever-breeding morass, rich only in frogs and slime. Liebeg tells us that it is because the water of rivers and streams contains oxygen in solution, that it effects the most complete and rapid putrefaction of the excrements contained in the soil which it penetrates, and in which it is continually renewed. Hence it is not sufficient in irrigating meadows to convert them into marshes by covering for several months the surface with water which is not renewed; for the advantage of irrigation consists principally in supplying oxygen to the roots of plants. The quantity of water necessary for this purpose, is very small, so that it is sufficient to cover the meadow with a very thin layer, if this is frequently renewed.

Much has been said of the importance to the farmer of what I may call his muck quarries; those deposits of decayed vegetable matter found in reclaimed swamps, and at the foot of mountains. Their importance, however, I apprehend, is not so much in the intrinsic value of the muck itself, as in its absorbent properties. It is rather a vehicle for the retention of fertilizing agents than a manure itself. Whilst I would not undervalue it, whilst I would rather urge you to use it liberally, I would at the same time say that the farmer who can procure the dust of the neighboring saw-mill, and who will use it as an absorbent of his liquid and softer manures, may compete with the most liberal user of muck. Bed your stables, cover your barn-yards, fill your domestic vaults with this cleanly refuse. It will do a disinfecting work that is but too often left undone. It will carry to the soil riches that would otherwise have passed off in vapor, or been buried in productive subsoil. Why are we so wasteful of those elements which the farmers of other lands so highly prize and so carefully gather? Allow me to instance two of those elements in particular—urine and bones. Of the former, I hazard nothing in saying we waste more in the United States than would be sufficient to increase our crops twenty-five per cent. A Flemish farm is considered incomplete that has not its urine cistern. In some of the cities of Europe the gathering of it is a trade as profitable to the gatherer as to the farmer to whom the gatherer sells. I boldly affirm that we are grossly deficient in one of the essential arts of civilization, so long as we make no provision, or even an inadequate provision for the absorption and removal to our tillable soil of the liquid filth of our cities, our barn-yards, and our private dwellings. Much is said in agricultural journals, and in works on agricultural chemistry, as to the value of the superphosphate of lime as a fertilizer. Its effects are almost miraculous, as those can testify who have dared to use it. One of our most charming lecturers has playfully said, that in this day we have only to administer a pinch of this irritative stimulus, and old mother earth is sure to snort a whole haystack of turnips. But to be serious again. It may be said especially by those of our farmers who live at a distance from our rivers and sea-board, that superphosphates are expensive and difficult to obtain. I answer that every farmer that can send to market for a carboy of vitriol, and that is willing to save his bones, or enterprising enough to buy the bones of the nearest village, can make it for himself at less than a cent per pound.

Mr. Termant, of Shields, one of the best farmers in Scotland, puts twenty-five bushels of bones into three old iron boilers, and next pours in two bottles of acid containing one hundred and seventy pounds each, and adds eighteen gallons of water to each boiler. In a day or two they empty the contents of the boilers into two cart-loads of light mould, with which it is thoroughly intermixed, and being turned over three or four times, after seven or eight weeks the compost becomes dry and mealy, and may be spread by the hand.—*Coleman's European Agriculture*, Vol. 2, p. 365.

Of the value of the manure thus prepared, not a word need be said. For

turnips it is especially valuable. Its value is permanent, too, benefiting the land almost as much the second or third year as the first. There are other manures of great value, on the importance of which, in an economical point of view, much might be said; but the limits of this address forbid. Ashes, lime and plaster have a value varying according to the character of the soil, and the local facilities for obtaining them. I attach more importance to the manufacture of home manures, than to all the guano that was ever imported. Guano is a powerful stimulus, I know; so is the crude ammonia of the drug store; and if we take into account the adulteration of guano, the ammonia is almost as cheap. It is certainly more portable, and pleasant to use. We have mines of manural wealth at home, which, if only developed, would enrich us more than the annexation of all the guano islands in the world.

The reclamation of unproductive soil may be mentioned as another duty growing out of the relation in which the farmer stands to his race. For no man has the multitude so many plaudits as for the returning conqueror. To subdue and annex some petty state is to earn an ovation. To my mind, the humble farmer who subdues the forest and turns it into waving corn-fields; who drains the swamp and transforms it into a smiling meadow, is entitled to much the greater honor. He is the benefactor of his race, and not the man in whose wake we find burning villages, destroyed vineyards, and fields of grain trodden into the dust. The true benefactor of his race is the man who seeks out in foreign lands seeds of greater fecundity than those indigenous to his native soil; who introduces breeds of cattle which excel in flesh producing and milk giving qualities, those which have been browsing the hills of his own land for centuries; and who, by experiment and expostulation, makes our mountain tops and our valleys to sing and blossom as the rose. Every man should inquire, not for his own mercenary and individual interest merely, but for the enriching of his race, are there any means by which I can increase an hundred fold in bulk and value the products of the soil? The farming that merely perpetuates the plans and policy of our forefathers, is not the farming demanded by this age of multiplied necessities and facilities. That farmer is behind his age, and is daily getting still farther behind, who does not understand at least the rudiments of chemistry as applied to soil; who does not rotate his crops with reference to their precise exhausting influence on the land; and who does not press into his service all available labor with every auxiliary mechanical aid, so as to bring a joyous plenteousness to his own dwelling, and to all the dwellings of the land.

Whilst taking this plain and practical view of our calling, allow me a word as to the "cultivation of roots and the breeding of stock." If I should be asked, what should be done with the little flat alluvial soil to be found in our County, I would say, plant two-thirds of it to roots. If I should be asked, what is the most productive and profitably tilled crop for a small farm, I should answer, roots. If I should be asked again, what a farmer having stock to raise, ought to prize the most highly, I should

answer, roots. If I should be asked yet again by some progressive farmer about to plant an extra acre, to what shall I devote that acre, I would answer, roots.—[*Sneetchen.*] If you wish to enrich yourselves, and give a two-fold agricultural value to the county, quadruple the area devoted to roots.

“With regard to the breeding of stock,” I feel it a duty to recommend a more enlightened and liberal policy than our farmers in general are willing to adopt. I believe it is possible for us to double the weight of cattle, to increase the production of butter fourfold, and there be a positive diminution of both cattle and labor. It is not necessary, I am sure, that I should say a word as to the folly of breeding in and in. You have seen but too often its exhausting and deteriorating effects, to persist in it any longer. There are two breeds that are being generally introduced among us, that above all others commend themselves to our especial approval. I allude to the Alderney and North Devon. The Alderney, or Geurnsey, is, as you are aware, a native of one of the islands of the British channel. As a general thing they have no beauty of which to boast. Usually they are small, thin, coarse-boned, with a loose rough hide. But what they lack in beauty, they more than make up in the liberality of their contributions to the pail. The Devons are from a county in England of the same name. Though comparatively small, they are almost without exception the perfection of symmetry and form. They are of a deep red color. They are strong, active, of remarkable gentle temper, and have, above all other cattle, those qualities which peculiarly fit them for the yoke. For fattening, they are the most profitable of all cattle. Mr. Coleman says that the North Devon stock have some strong advocates as a milking stock. The most productive cow he found in Europe was a North Devon, which for several weeks in succession, without extra feed, produced twenty-one pounds of butter. Mr. Bloomfield, the eminent tenant of Lord Leicester, after many years experience says, that the North Devon will give an average of four pounds of butter per week through the year. For my own part I am unable to determine between the claims of these rival breeds. For working cattle, and for beef, I should most certainly give the preference to the pure North Devon; but for the dairy, my choice would be divided between the Devon, the Alderney, and the Ayresshire. The introduction of any of these breeds cannot but be a public blessing.

I find it stated on the authority of the New York Tribune, that one hundred and fifty years ago, the average weight of cattle at the Smithfield market was not over 370 lbs., that of sheep 28 lbs. Now the average weight of the former is over 800 lbs., and that of the latter 80 lbs. What has been done in fat, may also be done in milk; and who can estimate in dollars and cents the addition that would thus be made to the material wealth of our own country, if all our cattle were brought up to this standard, and if all our cows were to give their maximum quantity of milk. It is idle to talk as some do of the cost of introducing such breeds, when I tell you that there are Englishmen who have paid over \$5,000 for a bull, \$3,000

for a cow,* \$15, for the use of a ram for one year. It may sound like romance; it is nevertheless true. The introduction of such stock, at any price, is a national benefit. A North Devon cow has been known to give 480 lbs. of butter in a year. What would our dairies yield if they averaged 300 lbs., or even 200 lbs. A cow giving 14 pounds per week is as readily cared for, as easily milked, and as cheaply fed, as one whose milk is half water, and which only yields six or seven pounds per week. It may be said that the extraordinary productiveness of this class of cows is to be attributed, not so much to breed as to the liberality and richness of their feed. I have read a story of a man, who having purchased a cow, represented as remarkable for her extraordinary yield of milk, from one of the richest pastures that could be found, and who upon taking her to shorter commons complained to her former owner that he had imposed upon him. "Sir," said he in reply, "I sold you my cow, but I did not sell you my pasture." Though perhaps no cattle will thrive better on scanty fare than our choicest imported stock, yet to realize their largest profit we must care for our pasture.

Allow me to add, moreover, and very briefly in this connection, that in order to test the quality or value of any breed of cattle, whatever, they should not only be furnished with plenty to eat, but should be sheltered from the weather, and protected from the ravages of vermin. The time, however, I dare say, has long gone by when it were necessary, upon an occasion like the present, to discuss the importance, or show forth the advantages of *stabling*; but there still remains a large proportion of our stock raising community who never dream but that they can afford to have the bodies of their animals made the battle field and hunting ground of myriads of villainous lice. My limits do not admit of my dwelling here upon its causes or cures; but you will allow me to say, and to say it with emphasis, that there is no fell influence which sooner and more effectually stunts and dwarfs a creature's growth than this lousy pest, and that undoubtedly thousands of dollars are annually lost to agriculturists in this county from the lack of any efficient effort to rid ourselves of this common and dirty foe.

The farming that I would recommend is that of the profitableness of which there can be no doubt. First, I would have a farm embracing no more land than with the means at command, could be thoroughly cultivated and cared for. I would have no pastures of eight or ten acres covered with tansy, mullen, elecampane and moss. No meadows rejoicing in daisies and snap-dragon, and with bush fences two rods wide. I would have a farm compact, well watered, with well proportioned plow and pasture lands, embracing an orchard of well selected fruit; a wood lot large enough to supply me with timber and with fuel. On such a farm I would have cattle free from those extraordinary points which suggest the strange phenomena of bones struggling for air, rather than visions of fat steaks and juicy sirloins. Then with careful and thrifty men to whom a weedy hedge-row, a bush in the midst of a meadow, or a wasting manure-heap would be a hor-

* Frequently 15 pounds English currency, equal to \$75, is given.

ror of horrors, I should expect not only profit, but contentment and pleasures, of the most refined and exalted kind, for I again affirm I know of no more delightful or rational occupation than that of caring for the soil.

In speaking of agriculture as an *amusement*, I do not wish to be understood as associating it with the many frivolous pastimes to which the idle and voluptuous give that name. I mean that it may be made, and that by thousands of the best men the world has ever seen, it has been made a delightful refuge from the heavier cares of life. I know that farming cannot be classed among those amusements which in fashionable circles, are called *elegant*. There are those who can only think of the farmer as associated with coarse and foul garments, and as bringing to their shrinking olfactories the smell of the compost heap. This may be the farmer of the city fop's ideal, but it is not mine. My ideal of a farmer is a cleanly, intelligent man, with robust frame, cheerful temper, cultivated mind, and kindly manners; one whose hand and whose house are as open as the sky. Of such a man kings need not to be ashamed. It was on a farm, you know, that our own loved Washington found a refuge and a solace after the storms of the Revolution, and mid the cares of state, like another Cincinnatus, he was wise enough to surround himself in his declining years, with the charms of a rural life. This seems to be the last and most natural refuge of all the great. The very name of Washington brings up the vision of Mt. Vernon, with its well-trimmed meadows sloping down to the Potomac. If I wished to see our great men in the serenity and majesty of their true character, I should not rush to the Senate Chamber, or crowd myself into our noisy courts of law. True, I might find them there, matchless in eloquence, unequalled in all that constitutes true statesmanship; and their words might fill me with admiration and wonder. But I repeat, if I would see them in the simplicity and loveliness of their true greatness, I would seek out their patrimonial or purchased acres. I would walk with them through their fields of cotton or of grain. To see Randolph in all the dignity of his manhood, I would go to Roanoke. I would sit with Clay under the oaks of Ashland. Webster I would visit at Marshfield or Franklin. I would walk with Silas Wright over the hills of St. Lawrence county; for there they would be greater men to me than in the gubernatorial chair or President's mansion. I know of no object so dear to the ambition of an English gentleman as the possession of a few broad acres, on which to spend the evening of his life.

Nothing by the Saxon is so highly prized as the old ancestral farm. It is a remarkable fact, that the wisest, most thrifty, and the most prosperous men of every country, make their ultimate investments in land and cattle. The industry and wisdom by which they have acquired wealth, urges them not only to give their wealth the most permanent and stable form, but also to secure that in which wealth can be the most perfectly enjoyed. The farmer can make his business subserve his pleasures at all times, and without the fear of ruinous reverses. This the merchant or the mechanic cannot do. He is not thrown into a fever of excitement by a panic in the

money market, or by a depreciation in the price of stocks; his customers but seldom fail; the market to which he carries his wares is rarely, if ever glutted.

Those things which on the exchange and in the counting-room, excite our worst passions, and which but too often lead to the most appalling crimes, are known to him only as terrible phantoms, darkening the dwelling and blanching the cheek of some associate of his earlier days, but which never comes nigh his abode to torment and stifle him.

It only now remains for me to speak of Agriculture as an ART. There is a sense in which every profession and calling may of right be thus regarded; a sense in which every man, no matter what the pursuit to which his energies be devoted, should be an artist. But what may be true in a general sense, is especially and peculiarly true of that pursuit on which, more than any other, the physical well being of mankind at large depends. We call the skillful plying of the graver—the delicate manipulation of the pencil—an art. We even talk of the art of brewing, and of baking. Ought not, then, that to be regarded as an art which beautifies the landscape for many a league, and on the perfection of which empires depend for wealth and which, if neglected or imperfectly understood, results in national degradation and overthrow. It is because agriculture is beginning to be recognized in its true character, that the establishment of agricultural schools is eliciting so much attention. During the past year the most eminent agriculturalists of the State met in one of our western towns to lay the foundation of an agricultural college. I have not time on the present occasion, whatever my disposition might be, to discuss the questions growing out of such an enterprise. Every year there ought to be a large number of young men trained for this pursuit, with as much liberality and thoroughness as for the practice of the learned professions. I greatly mistake, also, if there is not always a large number of intelligent and sometimes wealthy youth standing ready to avail themselves of the most thorough training that can be afforded them. For such young men I would have schools in which they could be thoroughly instructed in geology and agricultural chemistry, in vegetable and animal physiology, in theories of production and improvement, both with reference to animals and plants. After graduation in such a school, I would have the government select a number of the best farmers in every county, to whom these youth should be sent, that they might be taught to plow and graft, care for cattle, and harvest grain. Let a few hundred of young men thus trained be scattered over our State, and the whole practice of agriculture would be revolutionized in five years, and the material wealth of the Nation would be increased thirty fold. Such schools are established and such training is given in most of the countries of the old world. In this regard, no country has attained to so proud an eminence as Prussia. An intelligent correspondent of the "Country Gentleman" informs us that in Prussia there are four Agricultural Academies, one of which has seventy students,* six teachers,

* In Prussia there are four public Agricultural Academies to instruct young farmers who have some knowledge of physical science, and their bearing on agriculture. They are pro-

and a domain of two thousand acres. Now Prussia is but a province when compared with the United States, with its area (three millions of square miles), and yet we have not one agricultural seminary worthy of being mentioned with those just alluded to. I know that there are, and that there will be a thousand prejudices against specific training, such as we desire to see established in the United States. It will be stigmatized as new-fangled and visionary. But why, we ask, are we to have improvement in every branch of human industry, and no corresponding improvement in this, the fundamental pursuit of all? Science, I rejoice to know, has lately come most energetically to our help. It has increased our manures, pressed machinery into our service, and made horses and steam do the work on which we were wont to exhaust human muscle and nerve. We are also being laid every day under increased obligations to the press. Agricultural periodicals and books have not only exploded half the errors that bewitched the farming of our forefathers, but it has diffused information, of which to be ignorant is to be poor indeed.

If I could control the funds of the State, I would have a copy of every standard work on Agriculture, with a few copies of the best periodicals, placed in the School Library of every district in the land. I would go even further than this; I would employ such a number of lecturers on all our vital material interests, that no town should miss its lesson. Who can estimate the advantage that a score of intelligent travelers would be to a State? They would observe all that is important in cultivation; valuable in the breeding and care of cattle; and by turning our attention to choicest varieties of seeds, and the most select classes of sires, would fill our barns with plenty, and cover our hill sides with the perfection of flock and herd. Let us not, my fellow-citizens, lose the art in the occupation, the pleasure in the toil, the refinement in the gross and sensual. Let us give that measure of attention to the artistic and beautiful, as shall secure us the smile of all those who think our world a something better than a littered workshop, or a foul dwelling place. We should plant corn and raise cattle; but we should likewise plant trees, and cultivate flowers. We ought

vided with a laboratory, library, collections of natural history and philosophy, and a building for the practical purposes of husbandry. Land is attached to them for experiments in manures, plants, &c., which are conducted with a view to improve actual practice, as well as for the advance of science.

The oldest of these academies is at Eldena, in New-Citerior Pomerania. Out of its 1,650 Prussian acres, which are nearly equivalent we believe, to our own, 1,200 are devoted to cultivation as a farm—314 are in meadow, 40 in pasture, 19 in garden and hops, 6 in ponds, 17 in an experimental field, 2 or 3 in nursery. It comprises also a teacher in botany, zoology, and physiology of plants; an assistant in veterinary science, physiology of animals and breeding of horses; another in the cultivation and care of woodland; a third in architecture; a fourth in mathematics and surveying; a fifth in law, as connected with agriculture.

The second of the academies occupies 4,100 acres of a public domain called Proskau. The third is situated near Bonn, and is called Poppletodorf. This farm consists of 126 acres. Tobacco is cultivated here, and the technical professions are not carried on. Here is a botanical garden, a vineyard, seventy students and six teachers, including the director. Near Conigsburg, a fourth academy was opened a year ago called Walden. The domain contains two thousand acres.

to subdue the forest, and drain the swamps, but we ought also to build fountains, and trim *parterres*. The man who plants a turnip, should not forget the rose. Scott has remarked, that nothing is more completely a child of art than the garden. It is, as another has observed, one of the last refinements of civilized life. What is it that gives such a charm to the cottages and mansions of our fatherland? Is it not the clustering grape, the woodbine, the bed of daisies, the well trimmed hedge, and

“The sunny slopes where lambskins skip,
And tiny brooklets
Go laughing to the sea?”—

I do not know that I can bring these remarks to a more fitting close, than by giving in confirmation of what I have said to-day, the eloquent testimony of our country's great orator, Edward Everett.

“As a work of art, what is there on earth that can more entirely charm the eye, or gratify the taste, than a noble farm. It stands upon a Southern slope, gradually rising with variegated ascent from the plain; sheltered from the north-western winds by woody heights, broken here and there with moss covered boulders, which impart variety and strength to the outline. The native forest has been cleared from the greater part of the farm; but a suitable portion carefully tended remains in wood for economical purposes, and to give a picturesque effect to the landscape. The eye ranges round three-fourths of the horizon over a fertile expanse—bright with the cheerful waters of a rippling stream, a generous river, or a gleaming lake—dotted with hamlets, each with its modest spire; and if the farm lies in the vicinity of the coast, a distant glimpse from the high grounds of the mysterious everlasting sea, completes the prospect. It is situated off the high road, but near enough to the village to be easily accessible to the church, the school-house, the post-office, the railroad, a sociable neighbor, or a traveling friend. It consists in due proportion of pasture and tillage, meadow and woodland, field and garden. A substantial dwelling, with everything for convenience, and nothing for ambition—with fitting appendages of stable, and barn, and corn barn, and other farm buildings, not forgetting a spring house, with a living fountain of water, occupies upon a gravelly knoll, a position well chosen to command the whole estate. A few acres on the front and on the sides of the dwelling set apart to gratify the eye with choicer forms of rural beauty, are adorned with a stately avenue, with noble solitary trees, with graceful clumps, shady walks, a velvet lawn, a brook murmuring over a pebbly bed; here and there a grand rock whose cool shadow at sunset streams across the field—all displaying in the real loveliness of nature the original of those landscapes of which art in its perfection, strives to give us the counterfeit presentment. Animals of select breed, such as Paul Potter, and Moreland, and Landseer, and Rosa Bonheur never painted, roam the pastures, or fill the hurdles and the stalls—the plow walks in rustic majesty, and opens the genial bosom of the earth to the sun and air; nature's holy sacrament of seed time is solemnized beneath the vaulted cathedral sky; silent dews, and gentle showers, and

kindly sunshine shed their sweet influence on the teeming soil ; springing verdure clothes the plain ; golden wavelets, driven by the west wind, run over the joyous wheat field ; the tall maize flaunts in her crispy leaves and nodding tassels ; while we labor and while we rest, while we wake and while we sleep, God's chemistry which we cannot see goes on beneath the clods ; myriads and myriads of vital cells ferment with elemental life ; germ and stalk, and leaf and flower, and silk and tassel, and grain and fruit, grow up from the common earth ; the mowing machine and the reaper—mute rivals of human industry—perform their gladsome task ; the well filled wagon brings home the ripened treasures of the year ; the bow of promise fulfilled, spans the foreground of the picture, and the gracious covenant is redeemed, that while the earth remaineth, summer and winter, and heat and cold, and day and night, and seed time and harvest shall not fail."

AGRICULTURAL MUSEUM.

CATALOGUE OF AGRICULTURAL IMPLEMENTS, MACHINES, &c., IN MUSEUM.

Reapers.

Atkins' self-raking reaper.

Manny's (Wood's improvement) reaper and mower combined.

Kirby's reaper and mower combined.

Ketchum's improved reaper and mower combined.

Mowers.

Ketchum's mower.

Allen's mower.

Hallenbeck's mower.

Two machines for sowing grain by hand.

Horse and Dog Power.

Emery's horse power and thrasher.

Emery's dog power and churn.

Model—Wheeler's patent thrasher.

Model—Eddy & Co., horse power.

Plows.—Chinese, Mexican, India, and Modern.

Three wooden mold board and wrought iron shares, from 1780 to 1800.

Wooden wheel plow, as used on Mohawk Flats, N. Y., up to 1814.

French wooden wheel plow, with tongue and yoke for oxen.

Russian plow (model).

Jethro Wood's cast iron plow.

Wm. Beach's cast iron plow, patented 1820.

Wilkie's Scotch iron plow.

Ransom's English prize iron plow.

Eddy's Washington County wrought iron beam plow.

Eddy's side hill plow.

Cast iron beam plow, Anthony & Morrison, Troy.

Rich & Co., Troy, iron beam plows.

Rich & Co., subsoil plow.

Miniature plow of all work.

Prouty & Mears' center draught plows:

No. 30, stiff sod plow.

No. 5½, stubble plow.

No. 72, river flats plow.

B, subsoil plow.

No. 25, light sod plow.

London prize plow, 1851.
 Trojan plow.
 Delano's Diamond prize plow, 1844.
 Miner & Horton's Peekskill plow.
 Two hand plows, cast iron.
 Chase's Amsterdam prize plow, 1850.
 Titus' double plow.
 Warren's double plow.
 French's Michigan double plow.
 Horace L. Emery's subsoil plow.
 Peekskill prize fallow plow.
 Two of Gilbert's New Jersey plows.
 French & Co., Large Empire plow, Peekskill.
 do Small do do
 Burrell's shell wheel plow.
 Double mold-board plow (model).
 Russian plow (model).
 Dickinson's drain plow.

Miscellaneous articles.

Dederick's parallel lever hay press, Albany (model).
 Smead's patent dash churn.
 Lapham & Wilson's air-pressure churn.
 Sandford's portable farm and plantation mill.
 Spanish ox yoke, from Cuba.
 French ox yoke.
 Grant's fan mill (model).
 Share's cultivating and hilling machine.
 Share's cultivator.
 Improved corn hoe, used on plantations, and old plantation hoe.
 Robbins' root slicer.
 Sudney's revolving horse hay rake.
 Three-tined hay fork.
 Six-tined manure fork.
 Four-tined manure fork (Partridge's).
 Case potato hooks (Partridge's).
 Cast steel hoes, from Edge Tool Co., Chenango Co.
 Coon's harrow, made in Rensselaer county, 1825 (model).
 Cultivator teeth, Beach & Burritt.
 do Sayre & Kingsley.
 Plow clevis. Shepherd's crook.
 Grain cradle.
 Patent churn, operated by dog power.
 Phelps' patent bee hive.
 Basket for picking fruit in.
 Rives' patent dairy tub.

Schooley's patent preservatory (model).

Iron hog trough (feeding apparatus).

Thistle puller, from Solomon Walwrath, St. Lawrence county.

Dick's anti-friction cheese press.

Winne & Northrup, set bent fellies.

Seymour's broadcast seed sower (model).

Dynamometer.

Four apple parers.

Roe's cheese vat and heater.

Indestructable labels for fruit and ornamental trees, &c. B. K. Bliss, Springfield, Mass.

Chinese endless chain pump, for irrigation (model). Same principle as chain pump now in use.

do spinning wheel (model).

do bedstead (model).

do pillow.

do hoe.

Washington's desk, when President of the United States.

Specimens TAPA, or native cloth, from Sandwich Islands.

Sandwich Island fan, made from leaf cocoanut tree.

Calabash, from Sandwich Islands.

Blossom of the sugar cane, from Sandwich Islands.

Esquimaux dress, made from tanned seal skins.

Sections of bamboo, from Guana.

Turkish dress.

English farmers' dress.

Mammoth hornets' nest.

Amazon, by Kiss, Berlin, exhibited London, 1851.

Gov. Wright's (original manuscript) Address before New York State Agricultural Society, Annual Fair, Saratoga, 1847.

Von Humboldt's original letter, addressed to Gov. Wright, American Legation, Prussia, an acknowledgment of N. Y. S. Society's Transactions.

Limestone, from Syracuse, cut by machinery.

Toronto brick, pressed and dried in the sun.

Powder horn, on which is engraved a map of the courses of the Mohawk and Hudson rivers, and many towns, dated 1759.

Charter Oak, two pieces.

Three hair balls, taken from the maws of cattle (two from Sandwich Islands).

Cedar from Lebanon.

Cone of the cedar of Lebanon.

Capsul or bean pod of the cocoa, from the Island of St. Domingo.

Atlantic Telegraph wire, piece four inches in length.

Small shoes (pair), made in Dutchess county, 1787.

Specimen sycamore wood.

Specimen of a rail that was split in 1799 (sound).

Bottle of tea from Brazil.

Live oak wood from California.

Specimen cork wood from Turkey.

do do Brazil.

Specimen Oregon pine.

Nine specimens elm key wood.

Specimen red wood.

Six specimens oak treenail wood.

Specimen willow wood.

Specimen of wood from the old ship Niagara.

Annatto fruit, from which the annatto used in dairies is extracted.

Specimen pear tree, planted 1694, blown down when 204 years old.

Model of the mold-board of the plow invented by *Thomas Jefferson*.

Betel nut, from India.

Sulphur placed in a tree 1833, and shown in tree in 1858; no perceptible diminution.

Model of the United States Dry Dock at Brooklyn.

Brick from Old State Hall, two feet in length.

Portion of an oak tree with the horns of a deer embedded in it.

Old style hay knife.

Two old horse shoes, made before Revolution.

Scabbard of a bayonet.

Stock of a gun.

Spikes and wood from the hull of Commodore Perry's flag ship *Lawrence*, procured 1826, at Presque Isle.

A part of the SHOT RACK of the British frigate *Hussar*, and four **CANNON BALLS**.

Two old pitch forks.

Manure fork, made about 1800.

Coffee mill, in family use 1780.

Sad iron, kind in use 1760; similar to those improved at present day.

Spinning wheel, from Elinor Fry, used by her in 1777.

do brought from Ireland 1788, by Miss Mary Reed.

Three flax hetchels, brought from Ireland 1770.

Weaver's shuttle.

Old fashion shoe bottom, well dotted with spikes.

Rope made by the Indians of Northern California, who had never seen a white person; made of wild flax with the hands—used for snaring deer.

Hair twine, made by the natives of Sandwich Islands.

Albite, from Williamstown, Mass.

Model of machinery of the first cotton mill erected in this State.

Gutta percha pipe for waterworks.

Cedar borings.

Corn stalk twenty-two feet high.

Sunflower stalk from which paper is made.

Century plant stem, from Gen. Stephen Van Rensselaer, Albany.

Concrete, substitute for brick and stone.

Formation of bone taken from the head of an ox, the skull having been fractured by brutal treatment.

Fairbanks' platform scales and grocers' scales.

Druggists' scales.

Copying press.

Specimens glass, from New York.

Palmer's patent leg (model); prize at World's Fair, 1851.

Mammoth knife, from Boyd, Wilkins & Co., New York.

Deformed eggs.

Three eggs laid by one hen in one day.

Hydraulic ram (model).

Bottle rosin oil.

Rat trap.

Earthy or crude guano, from the Island of Ichaboe.

Bone dust, three qualities, from T. Coulson, Albany.

Bottle preserved fruit, from California.

White composition, hardened with steel, for all kinds of machinery.

Two hydraulic rams, Cowing's.

Patent pumps, do

Carpenter's adz.

Ransom's case hardware, plow castings, railroad chairs, &c., Ipswich, Eng.

Model of Watson's self-sustaining portable farm fence.

do Mitchell's portable fence.

Triangle sawed rail fence.

Barn floor, and liquid manure tank (model); Finlay Fraser, Oneida Co.

Furnace and kettle, for boiling feed (model).

Ancient pincers.

Spoke bit.

Specimens wrought iron.

Two chisels.

Nine samples tile, from Artcher & Co.

Wash tub, Vanauken's patent, Cohoes.

Bell, from Menesly's foundry, Troy.

Corner stone between New York and Quebec, 1759.

Rural chair, from B. C. Butler, Warren county.

California tarantula, in bottle, from Panama, by C. Van Rensselaer.

Varieties of domestic fowls.

A number of maps of United States, New York, &c.

Four geological maps.

One agricultural and geological map of New York.

Specimen of Australian oak and foliage (*Cassuarina*, she oak—"Shioe," Howitt).

Fifty specimens of the forest woods of New York.

Thermometers, barometers, &c.

Currier & Simson's union barometer, new.

Five show bills New York State Agricultural Society.

One show bill Seneca County do

Show bill of the Adirondac Steel Manufacturing Co., Jersey City.

do R. Garret & Sons, England.

do Chilson's new cone cylinder.

do Wheeler, Melick & Co., Albany, agricultural implements.

do Emery & Bros., Albany, do

do John Deering, celebrated plows.

do Rathbone & Co.'s stoves.

Books with samples of a great variety of fleeces of wool, from Europe and America.

Portrait of Prof. J. F. W. Johnston, Durham, England.

do Francis Quartley, celebrated Devon breeder, England.

do Robert and Charles Collins, celebrated Short-horn breeders, England.

do Professor Liebig.

do Gen. Jeremiah Johnson.

Plaster bust of Silas Wright.

Portraits of Presidents of New York State Agricultural Society :

Le Ray De Chaumont,

George Vail,

Jesse Buel,

Lewis F. Allen,

Archibald McIntyre,

John A. King,

John P. Beekman,

Ezra P. Prentice,

Anthony Van Bergen,

John Delafield,

Francis Rotch,

Henry Wager,

Joel B. Nott,

Samuel Cheever,

Benjamin P. Johnson ; also large
photograph, presented to Society

T. S. Faxton,

by O. B. Evans, Buffalo.

W. T. McCoun,

A. B. Conger.

John M. Sherwood,

Models, Paintings and Engravings of Cattle, &c.

Head of Short-horn bull, Lord Ducie, by James A. Hurst, presented by Herman Wendell, Albany.

Fifteen portraits of Short-horned cattle.

Thirteen paintings do

Three portraits of West Highland cattle.

One painting of do

Two portraits of North Devon cattle.

Seven paintings Hereford cattle.

One painting of Durham twin steers.

One portrait of Castle Howard oxen.

Models of short horn Devon cattle, South Down and Merino sheep, Berkshire swine.

Six paintings of horses.

Two portraits of Merino sheep.

One painting of Merino buck.

Three paintings of swine.

- Two portraits of Cashmere goats.
- Three portraits of sheep.
- Five pictures of flowers (colored).
- Nine pictures of vegetables (colored).
- Five pictures of fruit (colored).
- Two pictures of Chinese planting and transplanting rice.
- Painting, C. A. Peabody, New Hautbois strawberry.
- Painting of Dioscorea Batatas, or Chinese potato.
- Painting of Columbine, a favorite greyhound, owned by Mr. Pfiel, Eng.
- Engraving of Crystal Palace, England, 1851.
- Engravings showing the ages of horses by their teeth.
- do do brain of horses.
- Certificate of Guildhall Library, London, acknowledging the receipt of N. Y. State Society's Transactions.
- Frame of specimens of wool of Cotswold sheep.
- Diploma of Union Agricultural Society.
- do Ontario County do
- do New York State do (colored).
- do Exhibition of all Nations, London, 1851.
- Two lithographs of Ohio State Fair grounds.
- One lithograph of New York State Fair ground, Watertown, 1856.
- do do do (framed), Albany, 1859.
- Drawing of the New York State Agricultural College, Ovid, N. Y.
- Silk and prize Banner, Rose Bonheur's "Horse Fair," National Horse Show, 1858.

Cases Grains, Fruits, Wool, &c.

- One case corn, arranged by B. B. Kirtland, contains 34 varieties.
- do wheat, 17 varieties, from Algeria.
- do grains, seeds, &c., from D. A. Bulkley, containing 43 specimens.
- do do do do 40 do
- Grains, seeds, &c., from D. A. Bulkley, 1859, 17 specimens.
- Twenty-eight specimens of wood, grown on D. A. Bulkley's farm, Williamstown, Mass.
- Grains in stem, from Mrs. J. T. Van Namee, 10 specimens.
- Seeds, do do 10 do
- Grains, seeds, &c., raised in one year by W. P. Ottley (bottled), 29 specimens.
- Grains, seeds, &c., raised in one year by W. P. Ottley (stalks), 26 specimens.
- Grains, seeds, &c., raised in one year by Volney Burgess (bottled), 23 specimens.
- Grains, seeds, &c., raised in one year by Volney Burgess (stalks), 22 specimens.
- Grasses, bouquet of 17 varieties, by Volney Burgess.
- One case wheat, honey-comb, Chinese sugar cane, from F. Pilotte, Canada.
- One case wheat, 33 specimens, as exhibited by the New York State Agricultural Society, at the U. S. Exhibition, New York, 1853.

Grain from Scotland, 32 specimens, in stalk.

Three cases corn, raised in New York.

Two cases California seeds, grains, &c.

Two samples of flax crops.

Two cases wool-cotton and flax.

One case containing specimens flax cotton, from Cohoes.

flax silk, do

flax wool, do

specimens first process with flax, from Cohoes.

One case specimens Cashmere goats' wool, from S. Carolina.

winter flax, from Russia.

flax wool, from London.

flax yarn, do

Three cases fruit, 144 varieties of apples, pears, and plums, (half of one case devoted to preserved insects, which injure fruit).

Grains and Seeds of New York State and United States.

From New York:

One bottle Golden Australian wheat.

Sixty bottles wheat.

do Spring Club wheat.

Two bottles winter wheat.

do Blue Stem wheat.

do Black Sea wheat.

do Pithusian wheat.

One bottle Crate wheat.

do Noe wheat.

Ten bottles spring wheat.

do Tuscany Beard wheat.

One bottle Fife spring wheat.

do Old Red Chaff wheat.

do Red Chaff wheat.

do White Province wheat.

do White Flint wheat.

From California:

do Scotch wheat.

One bottle Highland wheat.

do Spex Red wheat.

do Sonora wheat.

Five bottles Soule's white wheat.

do Chili wheat.

Two bottles Red winter wheat.

do Lowland wheat.

do White do

From Illinois:

Three bottles Tea wheat.

One bottle Canada Club wheat.

One bottle China Tea wheat.

From Minnesota:

Two bottles China spring wheat.

One bottle spring wheat.

Four bottles Mediterranean wheat.

From New York:

One bottle Canada Club wheat.

One bottle India buckwheat.

do Canada Flint wheat.

do Black seed buckwheat.

do Talavera wheat.

do Grey buckwheat.

do wheat, 100 seeds weigh
55 grains.

do Blue buckwheat.

Fourteen bottles common buckwheat.

do Improved Flint wheat.

One bottle Multicole rye.

do Chidham wheat.

do Poland oats and Giant do

do White wheat.

Eighteen bottles common rye.

do Red Chaff winter wheat.

From Georgia:

Three bottles Siberian spring wheat.

Six bottles rye.

One bottle Bald white wheat.

From New York:

do Russian Beard wheat.

Fourteen bottles 4-rowed barley.

Two bottles 6-rowed barley.	Eight bottles 8-rowed yellow corn.
Six bottles 2-rowed barley.	One bottle Delavan white corn.
One bottle Japan barley.	do Stowell's evergreen corn.
Two bottles Herna barley.	do Jones' improved gourd
One bottle Escourgen barley.	seed corn.
do California barley.	do Dutton corn.
do English barley.	From Michigan :
Thirty-two bottles common oats.	One bottle Chocolate corn.
One bottle Scotch flour oats.	From New York :
Seven bottles Poland oats.	One bottle James' carrot seed.
One bottle Riga oats.	One bottle London Particular Scarlet
do Barley oats.	radish seed.
do Black oats.	One bottle rape seed.
do Sandy Scotch oats.	do Chinese sugar cane seed.
do Potato oats.	do white strapped leaved tur-
do Cuban oats.	nip seed.
do Black Canada oats.	do blood red onion seed.
do English oats.	From Patent Office :
do Green Mountain oats.	One bottle Cuba tobacco seed.
do Egyptian oats.	do Maryland tobacco seed.
do Grey oats.	do Mignonette seed.
From California :	do white large beet seed.
One sample wild oats, in stalk.	do Globe onion seed.
One bottle Linseed.	do white Globe onion seed.
do Canary seed.	do Savoy leaved spinnage
do Millet seed.	seed.
From New York :	do crimson clover (Trifolium
Twenty-one bottles timothy seed.	Incarnatum) seed).
Two bottles red clover seed.	do Large Early London cab-
Five bottles clover seed.	bage seed.
One bottle Japan grass seed.	do green Windsor beans.
do Japan millet seed.	do Japan beans.
Two bottles flax seed.	One bottle Eclipse Purple-topped
do white or yellow flax seed.	Yellow Hybrid turnip seed.
One bottle Riga flax seed.	From New York :
do Lucerne.	Four bottles Marrowfat peas.
One sample corn, from N. Y. State	do Black-eyed peas.
Ag. College farm.	Two bottles Imperial Dwarf peas.
Five samples white corn.	Thirteen bottles Field peas.
One sample improved King Philip	One bottle Runner peas.
corn.	do Golden Drop peas.
Three samples King Philip corn.	do Single Hopton-frame peas.
One sample Little Tom gourd seed	do Fairbeards Surprise peas.
corn.	do White Cluster peas.
One sample New Mexican White	do Washington peas.
Flint corn.	do Impl. peas.

One bottle Field Marrowfat peas.	One bottle Mammoth black peas.
do Canada peas.	do Rice peas.
Two bottles Kent peas.	Sixteen bottles beans, from D. A.
One bottle Cow peas.	Buckley, Mass.
do Small Cluster peas.	From Georgia :
do Spanish peas.	One bottle Housewife beans.
do green Garden peas.	do Dwarf beans.
do wild peas.	From New York :
From Georgia :	Five bottles white beans.
One bottle Chickasaw peas.	Four bottles Marrow beans.
do Brown spotted peas.	One bottle China bearded beans.
do Goat peas.	do Field beans.
do Jones' Gray Crowder peas.	do Egg beans.
do Jones' Large Crowder	do Case Knife beans.
peas.	do Kidney beans.
do white and spotted Crow-	do white Kidney beans.
der peas.	do Carolina beans.
do small claret and white	do Speckled Cranberry beans.
spotted Crowder peas.	do Canada Marrow beans.
do Shining or Java peas.	do Early Lima beans.
do Jones' Hay peas.	do Horticultural beans.
do Jones' Large peas.	do Butter beans.
do Jones' Black pod peas.	do Small Field beans.
do Lady peas.	do pumpkin seeds.
do Jones' Little Claret peas.	

Samples of Corn in Ear.

From New York :	One sample yellow Canada corn.
Three samples Red Blazed or Smut	Two samples blue pop corn.
Yellow corn.	do Adams' early yellow corn.
Three samples Red Blazed white	One sample New Mexican white Flint
corn.	corn.
One sample improved King Philip	do Rice pop corn, white and
corn.	red.
One sample Dutton corn.	Five samples pop and rice corn.
Two samples small Dutton corn.	Two samples white Dent corn.
Eleven samples white Flint corn.	One sample Jackson corn.
Four samples yellow corn.	do large Caird corn.
Two samples late Sweet corn.	One sample dark yellow, deep-toothed
Two samples early Sweet corn.	corn.
Five samples 8-rowed yellow corn.	One sample Ohio Dent (red and white)
Three samples 12-rowed yellow corn.	corn.
One sample 14-rowed do	One sample St. Regis corn.
Two samples 18-rowed do	do Chinese corn.
One sample 14-rowed white corn.	do Binghamton corn.
do Martha's Vineyard corn.	do Tillotson corn.
One sample Muldavian (seed from	do White (known as John
Russia) corn.	Dayton's) corn.

One sample flesh-colored corn.	Wild rice.
From Minnesota :	Cranberries.
Three samples corn.	

Preserved Grasses and Flowers.

Grass from the Valley of Sacramento, California.
 Prairie grass, or wild rice, from California.
 White clover, do
 Wild prairie grass, from Iowa.
 Rye, from Virginia.
 Cock's-foot grass, from Virginia.
 Kentucky blue grass.
 Large red-top herd grass.
 Large red-top herd grass, from Pennsylvania.
 Randall's grass, from Virginia.
 One hundred specimens grasses and herbage (preserved), and four bouquets, grasses and flowers, from the State of New York.
 One hundred and seven specimens prepared plants and flowers, and three bouquets, grasses and flowers, from the State of New York.
 Fifty-two specimens (pressed) preserved autumn leaves.
 Large bouquet of salt water grasses.
 Thirty varieties grasses, Columbia county, from J. S. Gould.
 Ninety-seven varieties prepared grasses and herbage, Rensselaer county.
 Seventeen varieties grains, in stalk, Rensselaer county.
 154 specimens of preserved plants, from Wm. M. Beauchamp, Skaneateles.
 Sample English hay, from J. O. Sheldon, Geneva.
 Samples white winter wheat, from R. J. Swan, Rose Hill farm.
 Ninety-four bottles of soil.
 Forty-one specimens of rock and ore, New York.
 Twenty samples of Irish peat.
 One bottle fresh water marl, from Peterboro, New York.
 do do Madison, do
 do do Madison pond, New York.
 One jar preserved milk, ten years old.
 Seven bottles sugar, made from Chinese sugar cane, from Philadelphia.
 One bottle syrup, do do do
 Two bottles syrup, do do New York.
 One bottle hickory nuts, from New York.
 One bottle superior dairy salt.
 One bottle Onondaga salt.
 One bottle solar salt, for dairy purposes.
 One bottle steam refined, pure rock salt.
 One bottle Spencer's pure dairy salt, from Syracuse, 1860.

Foreign Grains, Seeds, &c.

From England :	Two bottles Chidham wheat.
Two bottles winter wheat.	One bottle Essex wheat.
One bottle Rough Chaff wheat.	do Lamas red wheat.
do Harwell red wheat.	do Hard Fescue grass seed.

One bottle Crested Dogtail grass seed.	Little Wonder peas.
do Trefoil.	Dwarf Green Marrow peas.
Old Spanish dwarf or Fan peas.	Early Sebastopol peas.
Queen of the dwarf peas.	Napoleon New Blue Wrinkled Marrow peas.
Spanish dwarf peas.	Bishop's Long-podded Dwarf peas.
Knight's dwarf green Marrow peas.	Sugar peas.
Fairbeard's Champion of England peas.	Eugenie New White Wrinkled peas.
Groom's superb dwarf peas.	Ne Plus Ultra peas.
Victoria Marrow peas.	Champion of England peas.
Early May peas.	Paradise peas.
New Matchless Marrow peas.	Early Surprise peas.
Two bottles Early Green peas.	Early Nonpareil peas.
Three bottles Berbiges Eclipse peas.	Matchless Marrow peas.
Old dwarf Marrow peas.	Early Washington peas.
Sligas' peas.	Rising Sun peas.
Two bottles Woodford's Marrow peas.	Competitor peas.
Knight's tall green Marrow peas.	British Queen peas.
Monastery peas.	One bottle Suckling clover seed.
Two bottles Bishop's old dwarf peas.	do Chickory seed.
Two bottles Auvergne peas.	Two bottles Sanfoin seed.
Blue Prussian peas.	One bottle Burnet seed.
White Prussian peas.	do Wood meadow grass seed.
Two bottles Simitar peas.	do Meadow Festuca seed.
Grey peas.	do Pacey's rye grass seed.
Two bottles D. Bedman's Imperial peas.	do Italian rye grass seed.
Dancroft Rival peas.	do Sheeps' Fescue grass seed.
Two bottles Flack Imperial peas.	do Oat grass seed.
Two bottles Shilling's Grotto Marrow peas.	do Cocksfoot grass seed.
Two bottles Royal Dwarf peas.	Three bottles Chevalier barley.
Four bottles Knight's Dwarf Marrow peas.	Two bottles Scotch Hopetown oats.
Two bottles Thurston's Reliance peas.	do English oats.
Two bottles Early Emperor peas.	One bottle Potato Scotch oats.
do Ringwood Marrow peas.	do Green Windsor beans.
do Essex Champion peas.	do English Mazagan beans.
New Purple Pod peas.	do Early do
New Royal Green Marrow peas.	do Scarlet Blossom beans
Denyer's do do	do Helligoland beans.
Sangster's No. 1 peas.	do Fan or Bog beans.
Dickson's Early Favorite peas.	do English Scarlet Runner beans.
	do Early Long Pod beans.
	do Thick Windsor beans.
	do Late do
	do Solitaire beans.
	do English Windsor beans.

One bottle French beans.	Five bottles Wheat.
do English Horse beans.	One bottle Bantarie wheat.
do Green Long Pod beans.	From Austria :
do French Mazagan beans.	One bottle Winter wheat.
do Essex Helligoland beans.	do Austrian wheat.
do Hangdown Long Pod	Two bottles Spring wheat.
beans.	One bottle Red winter wheat.
do Mumford beans.	do White wheat.
From Algeria :	Spelter wheat.
Three hundred and thirty-one bottles	Yellow beans.
seeds, grains, and different pro-	One bottle Horse beans.
ductions.	do White beans.
Ten samples tobacco.	do Marsh beans.
Thirty-six samples wool.	do Dwarf beans.
do cotton.	do Dwarf white beans.
One bottle Flageolet beans.	do Black oats.
Eight bottles beans.	Two bottles Barley.
One bottle black beans.	Buckwheat.
do Lima beans.	Peas.
do Horse beans.	Early peas.
do Kidney beans.	Grey peas.
do English Horse beans.	Yellow corn.
Five bottles peas.	Early yellow corn.
One bottle Wrinkled peas.	Early corn.
Turnip seed.	White clover seed.
Hemp seed.	Red do
Red onion seed.	White millet seed.
Sunflower seed.	Yellow do
One bottle Lucerne seed.	Grey do
do Sesame seed.	Flax seed.
Three bottles Cole seed.	Hemp seed.
One bottle Saffron.	Rye.
Two bottles Sorghum seed.	From Asia :
One bottle Anise seed.	One bottle Turkish Flint wheat.
do Coriander seed.	One bottle Turkish Flint wheat, from
do Flax seed.	Mount Olympus.
do Cabbage seed.	From Bavaria :
do Carrot seed.	Three bottles Cabbage seed.
do Millet seed.	do Beet seed.
do Chickling Vetch.	Two bottles Turnip seed.
Two bottles Lentils.	do Millet seed.
One bottle Madia Saliva.	Parsnip seed.
Two bottles barley.	Sainfoin.
One bottle Yellow corn.	Lentils.
Two bottles White corn.	One bottle Rye.
Five bottles Peanuts.	do Barley.

- One bottle Bald Barley.
 Three bottles Buckwheat.
 Two bottles White corn.
 do Yellow corn.
 Red clover seed.
 Three bottles black Soup beans.
 One bottle dark yellow beans.
 do Pate do
 Four bottles Horse beans.
 Three bottles white beans.
 Long white beans.
 Peas.
 Grey peas.
 Early peas.
 Bavarian peas.
 From Barbary :
 One bottle Barbary wheat.
 From China :
 One bottle corn.
 From France :
 One bottle French garden peas.
 Lentils.
 Two bottles Red Trefoil.
 One bottle Tares.
 do Lucerne.
 do Vetch D. Printemps.
 do French buckwheat.
 do Early Noe wheat.
 do Giant St. Helena wheat.
 do Chidham wheat.
 do French wheat.
 do Cheltenham barley.
 do Serradel, used for food in Portugal.
 do French white carrot seed.
 do Parsnip seed.
 Two bottles French oats.
 From Flanders :
 One bottle White Flanders wheat.
 do Wheat.
 From Greece :
 One bottle white beans.
 From Germany :
 One bottle Linseed.
 do Panicum Germanicum.
- From Hungary :
 Three bottles Red winter wheat.
 Spelter wheat.
 One bottle Yellow wheat.
 do Spring wheat.
 do Buckwheat.
 do Rye.
 Two bottles Flax seed.
 Three bottles Sorghum seed.
 One bottle Winter rape seed.
 do Cabbage seed.
 do Rape seed.
 do Yellow millet seed.
 do Grey do
 do Mixed do
 do Beet seed.
 Two bottles Lentils.
 Vetches.
 One bottle Italian grass seed.
 do Red clover seed.
 Two bottles Small yellow corn.
 One bottle Large do
 do Dark yellow beans.
 do Variegated beans.
 do Chimby beans.
 do Black beans.
 do White beans.
 do Cranberry beans.
 do White flat beans.
 do Grey peas.
 do Yellow peas.
 do Barley and oats.
 Two bottles oats.
 From Italy :
 One bottle Tuscan straw hat wheat.
 do Italian spring wheat.
 do Buckwheat.
 do Barley.
 Three bottles oats.
 One bottle Yellow beans.
 Two bottles White corn.
 do Yellow corn.
 One bottle Yellow corn, 50 days.
 do Rice.
 Mulberry seed.

From Island of Candia :

One bottle Dwarf beans.

From Island of Maderia :

One bottle rice.

From Lombardy :

One bottle Early yellow corn.

do Grass seed.

do Mulberry seed.

do Grey millet seed.

do Flax seed.

do Clover seed.

Two bottles rice, shelled and unshelled.

One bottle variegated beans.

From Newfoundland :

One bottle Cheltenham wheat.

From Peru :

Four bottles corn.

From Prussia :

Two bottles wheat.

do rye.

Three bottles barley.

One bottle buckwheat.

do oats.

do flax seed.

Two bottles rape seed.

One bottle peas.

Seven bottles beans.

From Russia :

One bottle rye.

do Winter rye.

do Italian millet seed.

Three bottles Caucasian wheat.

Dantzic wheat.

Bielotoucka wheat.

Saumer wheat.

Kolan's wheat.

Russian spring wheat.

Hard spring wheat.

Linsen seed.

Riga flax seed.

White Russian flax seed.

From Sardinia :

One bottle yellow wheat.

Two bottles rye.

One bottle Siberian wheat.

One bottle Siberian oats.

Three bottles field beans

Yellow beans.

Turtle Soup beans.

Eyed beans.

Queen beans.

Two bottles garden beans.

One bottle Dwarf beans.

do White beans.

do Black-eyed beans.

do Chimby beans.

do Roma white beans.

Three bottles early corn.

Late corn.

Dwarf corn.

Millet seed.

Clover seed.

Hemp seed.

Lupines.

From Spain :

One bottle white Lupines.

do Pithusian wheat.

do Geja wheat.

do Six Weeks' corn.

From Syria :

One bottle rye, from Damascus.

do Syrian spring wheat.

From Sicily :

One bottle Red wheat.

From Turkey :

One bottle winter wheat.

do Mixed wheat.

Two bottles wheat.

One bottle rye.

do oats.

do White corn.

Two bottles beans.

One bottle Horse beans.

Two bottles Lupines.

do Lentiles.

Three bottles turnip radish seed.

Dandelion seed.

Two bottles poppy seed.

Sesame seed.

Parsley seed.

Coriander seed.

Carrot seed.	Three bottles peas.
Cotton seed.	Chick peas.
Cabbage seed.	Garden beans.
Hemp seed.	White beans.
Millet seed.	Yellow beans.
Vetches.	Three bottles Large yellow corn.
Two bottles rice, shelled and unshelled.	Two bottles Early do
One bottle chestnuts and black walnuts.	Two bottles Millet seed.
One bottle Tenugrece.	One bottle Hemp seed.
do Lurel.	do Radish seed.
do Acorns, cherry stones, &c.	do Asparagus seed.
do Fir tree.	Two bottles Anise seed.
do Racine Orris.	Two bottles Small Garden Parsnip seed.
do Beech nuts.	One bottle Garden Broom seed.
do Ginguel Cawi.	do Hops.
do Sulphur.	do Dried fruit.
do Orris root.	do White maple.
do Almonds.	do Beech nuts.
do Gum.	do Lime tree leaves and flowers.
do Saffron.	Two bottles Chestnuts.
do Salep, a plant.	One bottle Teazles.
From Tuscany:	do Acorns.
Two bottles oats.	do White Aconite seed.
do Red winter wheat.	do Fcnuel.
One bottle English wheat.	One case flax seed cake.
do White wheat.	One case rape seed cake.
Two bottles Tentre wheat.	One case hemp seed cake.
One bottle spring bearded wheat.	One case fossil brick.
Three bottles barley.	

Foreign Seeds.

From French Exhibition:	One bottle Multicole rye.
One bottle Narianapoli winter wheat.	do Scotch Flouring oats.
One bottle Hunter wheat.	do Black oats.
do Black Petaurelle wheat.	do Castor beans.
do Square Cicilian wheat.	do White Flour Marsh beans.
do White Tuscan wheat.	do Marsh beans.
do Bostock wheat.	One bottle White corn, from the highest cultivated peak of the Andes.
do Tuscan wheat.	One bottle White Swede turnip seed.
do Cauivand or Soft wheat.	do Cabbage seed.
do Herrison winter wheat.	Two bottles Vetches.
do White Velvet wheat.	
One bottle Mummy wheat, with linen wrapper, 2,500 years old.	One bottle Bassana beet seed.
One bottle Spelt.	do Essex Coriander seed.
do Buckwheat.	do Rape seed.
	do Burnet grass seed.

Seeds received through the American Minister, Hon. Joseph A. Wright, Berlin, Prussia, from Merzt & Co., Berlin :

Festuca heterophylla—Used as pasture on light soil instead of the smaller kinds. Twenty-five pounds on the Prussian morgen ($\frac{20}{11}\frac{3}{8}$ to English square yard) is used with fall or spring seed.

Phalaris arundinacea—Is recommended on meadows with good soil, producing great quantities. Ten pounds on the Prussian morgen.

Bastard clover—*Trifolium Hybridum*—Is used on heavy moist soil as pasture and for hay. Six pounds on the Prussian morgen.

Sand Luzerne—*Medicago media*—In place of medicago sativa, when the soil gets too light ; used with success. One and one-fourth pounds on the Prussian morgen.

Anthyllis vulnerana—Is recently recommended as pasture on sandy soil, but little tried. One and one-fourth pounds on the Prussian morgen.

Spergula maxima—A well tried herb for pasture. Summer plant of very short growing time. One-fourth Prussian scheffel (or bushel $\frac{1}{11}\frac{1}{2}$ to English) on Prussian morgen, to sow in the spring.

Heracleum Sibiricum—Beautiful as an ornamental plant. As feeding plant recommended, but not generally known. Plant in fall in seed bed, next early summer, transplant in good soil, three feet apart.

Proboteier Rye—This kind is acknowledged the best for the climate of Northern Germany.

Eroum moranthos—Recommended as a mixture with other pasture herbs on light soil. The fruit is used as human food, but is coarse.

Varieties of wheat, barley and oats in sample.

Lupinis Termis—Pasture herb for southern climate. One Prussian scheffel on the Prussian morgen ; sow early in spring.

Schmatz stokirban turnip—A variety of fine taste for kitchen use. To sow in seed bed and then to transplant.

Finnland May turnip—A variety recommended for kitchen use. To sow in the garden in spring very thin, to be used in summer for the kitchen.

Chaerophyllum Prescotti—For the finer table use, somewhat larger than the common kind. To sow in the fall or spring.

Winter Buritz—A hybrid frequently used for culture on a large scale. Five pounds (at the end of August) on the Prussian morgen.

Same as above—another variety.

Erfurt Celery—An excellent variety ; the plants to be raised in hot bed and transplanted on well manured garden land ; bulb branches below ground.

Brussels sprouts—Is more and more liked in Germany for table use. The plants to be raised in hot bed.

Assortment of *gourds*, only for ornamental use.

Althea rosea, fr. niger—A lately used plant for dying. The flower is used for coloring the red wines. To transplant in summer from the seed bed ; it blows in the second year.

Goundi—Tobacco—A variety proved to be the best for the climate of Germany.

In addition to these, numerous samples of wheat, sixty kinds ; rye, barley, twenty-six kinds ; oats, twenty-six kinds. Two varieties choice potatoes, the *Frederic William* and *White fleshed potatoe* (on trial).

Imperial Department of Agriculture, St. Petersburg.—Twelve varieties of grains, wheat, rye, maize, millet, barley, &c.

ENTOMOLOGICAL MUSEUM.

Specimens of wood, showing effects produced by different insects and worms, and collection of worms and insects :

- Two cases butterflies.
- Two cases beetles.
- Cocoons of the cecropia emperor moth.
- Cecropia emperor moth (larva).
- Apple and peach borers.
- Apple tree caterpillar and curculio.
- Yellow-necked apple tree worm.
- Apple-bark louse.
- Peach borer, on twig.
- Caterpillars' eggs, 16 belts on one small branch of cherry.
- Cocoon of a lappet moth, on cherry.
- Cocoon of the cherry abia.
- Caterpillars' eggs on the wild black cherry.
- Lophocampa caryæ*.
- Hickory borer.
- Larva of the hickory moth.
- Nest of a Brazilian wasp.
- Wood ruined by the white ants of Brazil.
- Nests of the common wasp.
- Nests of the mud wasp.
- Nests of the hornet.
- Cells of a small green bee.
- Cells of a mud wasp.
- Section of the stomach of a horse, showing perforations of its inner coat by bots.
- Specimen of book-binding, as gnawed by cockroaches.
- Mustard stalk distorted by plant lice.
- Currant stalk covered with apple-bark louse.
- Corn stalk mined by an undescribed spindle worm.
- Specimen Hessian fly.
- Specimen wheat midge.
- Specimen weevil.
- Specimen joint worm.
- Specimen chinchbug.
- Elliptic galls in the stalk of Virgin's Bower.
- do stem of Johnswort.
- Hoplike galls on shade grass.
- Prickly galls on rose leaves.

- Prickly galls on stalks of the raspberry.
 Smooth galls on do do
 Rose galls on the Golden rod.
 Globular galls on the stalks of the Golden rod.
 Oblong galls on the stem of the Figwort.
 Oak-apple galls on the leaves of red oak.
 Tubercular galls on twigs of the white oak.
 Bullet do do
 Spongy do do
 Woolly galls on leaves do
 Nail-head galls on leaves of the white oak.
 Grape do do
 Shot galls on the leaves of the Black oaks.
 Cellular galls on the twigs of young oaks.
 Spathe-like galls on twigs of the willow.
 Rose do do
 Blister-like do do
 Egg-shaped do do
 Egg-shaped imbricated galls on upland willow.
 Apple-like galls on leaves of sumach.
 Pine-head galls on leaves of hickory.
 Mountain ash, covered with *scale insects*.
Wax-like insects, which blight the bitter-sweet.
 Eggs of the *apple-tree caterpillar* on a twig of thorn.
 Sycamore or butternut wood, showing the track of a *Buprestis* larva in the outer sapwood.
 Basswood mined by *white ants*.
 Burrow of a *Buprestis larva*, under the bark of basswood.
 Limb of the clammy locust, showing the rough and blackened appearance caused by the *bark louse*.
 Tracks of the *locust borer*, in the heart of a locust tree limb.
 Eggs of the *executioner bug* on the bark of poplar.
 do do do maple.
 Limb of black oak, cut off and mined by the *oak pruner*.
Carpenter moth, male.
 do crysalis.
 do (larva).
 White oak bored by the *carpenter moth*.
 White oak post, as ruined and destroyed by *white ants*.
 Caterpillars of the willow butterfly killed, and their skins riddled by *ichneuman flies*.
Alder blight. (*Eriosoma tessellaris*).
 Track of a *bark beetle* in striped dogwood.
 Twig of *Primo verticillatus*, showing the white spots thereon, produced by the *bark louse*.
Apple-tree caterpillars' eggs, deposited on dogwood.
Bark lice on sumach.

- Smooth sumach, the twig killed by *wooly scale insects*.
 Stalk of red osier, covered with fixed female *bark lice*.
 Track of a *bark beetle*, in willow.
 Wood showing holes perforated by the *touchwood beetle*.
Scale insect, resembling white wax, on limbs of the osier.
 White pine stalks, showing the leading shoots killed, and the growth stunted by the *Pine weevil*.
 Wood showing the track of the *pine tree borer*.
 Track of the *wood-engraver bark louse*, on white pine.
 Track of the *little bark beetle*, under white pine bark.
 Finger-like tracks of the *pine-bark beetle*, on the surface of white pine wood.
 Same on white pine bark.
 Pine bark perforated by one of the larger kind of *bark beetles*.
 Red cedar wood mined (probably) by the *stump wasp*.
 Specimen of elm, as bored by the *locust*.
 Axe-helve destroyed by some species of *hickory boring beetle*, the *Apatе basillaris*.
 Pin-holes in apple wood, bored by *pear-blight beetle*.
 Tracks of the *pear-blight beetle* in apple tree wood.
 Pin-holes in apple wood, bored by the *apple-bark beetle*.
 Burrows of the *Buprestis*.
 Young apples withered, wounded by the *thrips*.
 Track of an *apple-tree borer*.
 Perforations of eleven *apple-tree borers* on one young tree, two inches in diameter.
 Ring of eggs of the *caterpillar*.
 Burrows of the *apple-tree borer*.
 Burrows of the *peach-tree borer*, on the roots of plum trees.
 Excrecence on apple roots, caused by *blight*.
Apple-bark louse encrusting a young sweet bough.
 Black knot on hickory trees, on which trees *hickory weevil* is found.
 Scars in the hickory bark where the borer has come out.
 Twig of walnut, showing the white spots thereon, produced by the *bark louse*.
Bark lice on hickory.
 Hickory mined by the *walnut ant*.
 Burrows of the *hickory borer*.
 Cell of *walnut borer*, with the orifice.
 Chestnut rails, mined by the *large ant*.
 Limb of the peach tree, as when killed by the *bark louse*.
 Leaves of apple trees, as when eaten by *caterpillars*.
 Hatched eggs of the *apple-tree caterpillar*.
 Eggs do do
 Nest of the *caterpillar* on the apple tree.
 Specimen of the trunk of an apple tree from Cambridge, N. Y., showing the effects produced by the *apple-trunk borer*, 67 inches in circumference, and 22 inches in diameter.

Black knot on cherry trees, supposed to be caused by the *plum weevil*.

Currant twig, its pith destroyed by the *currant moth*.

Hemlock bark, as perforated by the *Downy woodpecker*, erroneously thought to be in search of insects.

Specimen of elm, as bored by the locusts.

Soft maple, showing the effects produced by the *maple-bark scale insect* (*Lecanium Arcericorticis*).

Grasshoppers from the Isthmus of Darien, presented by Charles Van Rensselaer.

Three cases containing collections of insects.

MEMORANDUM OF TOOLS, &C., FROM CUDDAPAH, INDIA, PRESENTED TO AGRICULTURAL MUSEUM, BY L. H. MORGAN, OF ROCHESTER.

Hatchet, used for cutting small trees, and also for digging up roots.

Painted axe, for digging hard earth overgrown with bent grass, &c.

Large plow, for plowing waste lands of long standing; ten pairs of bullocks are yoked to it.

Large harrow, for breaking the mud lumps and clearing them off the grass, &c., after the soil is plowed by the large plow.

Small harrow, for removing stubble from fields annually cultivated.

Heavy harrow, for harrowing soil or filling up streaks on earth, after seeds are sown.

Heavy drill plow, with six teeth, funnels and tubes, used for sowing grains, viz: Jonna, arcea, red granus, horde grain, cora, raze and Indigo seeds, &c.

Cotton drill plow, funnels and tubes not forwarded, as they are thicker than that of the heavy drill plow.

Small drill plow, with three teeth, funnel and tubes, used for sowing Bengal grain and wheat. The tubes and funnel are wider than the sower of Jonna, &c. When lands annually cultivated are cleared of grass, &c., by means of the small harrow, this instrument is used to plow them, to render the earth soft; and also seeds are sown through it.

Species of harrow. When the crops are of a span height, this tool is used to remove useless grasses and herbs from the streaks, and add earth at the bottom of the stalks.

Sickles, used to cut ears and stalks, &c.

Species of sickles. When harrow is driven, this tool is used to remove from the harrow, mud, grass, &c., which may be sticking to it, and also it is used for digging grass.

Small rake. It has generally from four to eight teeth; used for collecting ears of corn to a heap, and to bed them on floor for being trodden.

Levelling pole, with four planks, used for making fields in garden lands and for heaping grain.

Heavy yoke, used to be attached to heavy drill plows, &c., harrows.

Small yoke, to be attached to large plows, large and small harrows; it is also used to yoke bullocks drawing buckets and bandies.

Leather strap, used for connecting yokes with plow beam.

Thick heavy rope of fibers, for tying all plowing tools for being fastened to the strap.

Cord of fibers, to be tied to the horns of bullocks to serve as reins.

Two muzzles, of basket work, shutters to the mouths of the plowing bullocks, to prevent them from grazing.

Straps, to be tied round the bullocks' necks to the yoke.

Hoe, to dig dunghills and other heaps, and for turning water courses.

Twenty-three tools, used for wet cultivation operations.

Small plow, used for plowing moistened lands or fields.

A plank with a long wooden handle, for levelling the moistened fields.

Tools forming pumps:

Two standing poles, to be fixed in the ground on the edge of the well.

Beams, to be fixed across them.

Two small sticks to be placed perpendicular upon the beam, in the middle of it, at the same distance from each other.

Wheel, to be placed between the small sticks to enable the rope to move.

Two poles or supports, to be placed against the standing poles to prevent their shaking.

Pully, to cause the trunk cord to move.

Leather bucket to carry water.

Leather cable, to be tied to the bucket.

Trunk cord. It is tied to the mouth of the trunk to prevent loss of water when being drawn.

Twelve tools for carpenter work:

Big adze, to be lifted up by both hands, for working large pieces of wood, &c.

Small adze, used for working small pieces of wood.

Big chisel, to cut pieces of wood and make holes in them.

Small chisel, to make small holes.

Short wooden mallet, to be struck on the chisel when making holes or cutting wood.

Gimlet, to make apertures or small holes.

Two tools, (names unknown,) used to form edges, &c., in smoothened wood.

Nine tools used by ironsmith:

Anvil, blockstand, sledge hammer and big hammer.

Block being placed on floor, the anvil is fixed on it; the burning iron piece is put on the anvil; a separate man will beat the piece with sledge hammer, and the ironsmith will smooth it with big hammer.

Small hammer, used to make small nails.

Large and small tongs. Large ones are used to handle heavy pieces of burning iron, and small one only light pieces.

Crooked tongs, to handle large pieces of burning iron to be made into axes and hatchets.

Iron pan, to move coals, &c., put in fire pit, and remove iron scums from it.

Iron piece resembling chisel, for breaking iron bits.

File of this district, to smooth and polish metals.

Iron stand and bit, to make holes.

Two bellows, used to blow fire.

Earthen small tube. The two tubes of the bellows are placed in this tube to admit the full passage of air.

In addition to the above, a large assortment of tools used by goldsmiths in making gold and silver ornaments. Also tools used for making earthen pots, and tools for cleaning cotton; wheels for spinning, and looms for weaving.

The following extract from a very interesting article in the *New York Weekly Tribune*, May 19, 1860, in relation to the museum, indicates its advantages.

The museum room is about 67 feet long by 37 wide, and has two galleries supported by light iron columns. The room is lighted by side windows as well as by two enormous sky-lights in the roof, and is as well adapted to the purposes for which it was built as any we have ever seen. The stairways are of iron, and a neat iron railing runs around each gallery. Against the walls are glass cases, those on the main floor being appropriated to miscellaneous articles, such as costumes and fabrics of foreign nations, antiquities and relics of this country, and curiosities in the way of sports of nature, old spinning wheels, looms, minerals, and other matters of interest. The cases on the second floor are filled with a most complete set of specimens of the grains and seeds of our own and various foreign countries, which in itself is a study of a most interesting nature. The seeds of America coming first in order, we see here scores of varieties of Indian corn, many of wheat, rye, oats, and other cereals; and a very complete assortment of all the common and uncommon garden vegetables. England, Hungary, Bavaria, Austria, France proper, African Colony of Algeria, are all represented by numerous specimens. The resources of almost every European and some Asiatic countries, are more or less completely illustrated in these cases, and it is a curious study for the farmer to notice how closely grains from widely separated countries resemble each other.

The cases along one entire side of the third floor are appropriated to Dr. Asa Fitch's entomological collections, which already are superior to any others in the world in many respects. Time will be when the zealous student of Natural History will be able to study the nature and habits of our noxious and other insects more satisfactorily on this third floor of the State Society's Museum than he could anywhere else, and time will also be when our farmers will awake to the fact that one of their greatest benefactors has lived out his quiet life, and perhaps laid him down to die in an obscure rural district, with no monument to keep green his memory except these splendid collections which he freely gave years of his life to gather from our fields and forests.

The Fitch collections, when arranged this fall, will be divided so that the various insects in all their stages—egg, larva, pupa, and moth—will be

placed in drawers beneath the cases, while the more roomy space of the latter will be devoted to the display of specimens which illustrate the ravages of the insects. There are now but few specimens set up in the cases, but quite enough to show the ultimate value of the collection. Thus we have a piece of basswood the substance of which has been mined out by white ants. Alongside it is a glass covered box which contains specimens of our dread foe, the wheat midge, its larva, a male fly, and kernels of wheat shrunk and ruined. Another of these little boxes shows us the Hessian-fly, its larva, its flax-seed-like eggs, and a wheat straw broken open to show the "flax seeds" within. Here we have a twig of mountain-ash covered with scale insects; here, on a twig of poplar, the eggs of the "executioner tree bug" strung along in two unbroken parallel and contiguous lines, like a string of sandal-wood beads or a daintily-braided strand of maiden's hair; here we have a limb of black oak cut off by the oak-pruner; here a piece of red cedar—which every one has believed insect proof—utterly destroyed by the stump wasp; while, like the mysterious foot prints in the red sand-stone and chalk, on the bit of pine bark are to be seen the finger-like tracks of the "pine bark-beetle," starting from one central pit or hole, and spreading—always four at one side and two at the other—like the fingers of a hand. In a bottle of spirits, here we have the larva of the "hickory moth," the largest known, which is so frightfully ugly—what with its long horns, and bamboo like joints—that we cannot blame the plantation darkies for calling it the "horned devil." Here is a hickory ax-helve, sound as a nut when first made, but since then completely riddled at one end by some hickory beetle, probably (says the label) by the *Apate basillaris*—which of course will be perfectly intelligible to every one of our readers. In this case, near the stairway, we see a great section of applewood—five feet seven in circumference, one foot ten in diameter—which has been literally honeycombed by the borer. Not to occupy space with further enumeration, we will merely say that by this time next year, farmers passing through Albany will be able to examine, in this collection, several thousand specimens of insects and their ravages.

On the ground floor are arranged numerous American farm implements which have from time to time been donated to the Society. The foreign visitor can here see many of our best variety of reapers and mowers, drills, harrows, cultivators, fan-mills, and a large collection of plows not only of the latest improved patterns, but, what is especially valuable for comparison, those clumsy contrivances of wood with which our grandfathers pried apart their stubborn furrows. Among the best of the modern plows is the "center-draft," of Prouty & Mears, which was honored at the London World's Fair with a first premium. If ever an award was honestly earned from reluctant judges, we esteem that this one was; and however public opinion may be divided in the Henan-Sayers case, it must be fairly conceded that our English friends did the fair thing for American plows—when they were forced to do it. At the trial in question, Colonel Johnson heard the English laborers discussing the merits of the Yankee

plows in uncomplimentary terms. They had decided that the flimsy things would break, or at any rate that they would not run in. This latter seemed the opinion of the plowman who was ordered to guide the Prouty & Mears plow, for he persistently bore upon the handle with his whole weight in the benevolent intention of forcing the nose to enter to the requisite depth until he was ordered by the Colonel to let it do its work as intended. The man turned two furrows around his "land," and then admitted in a loud "aside" to some of his anxious friends, that "that ere dom'd thing would 'a held itself if oi'd a let it."

Not one of the least valuable things in the Society's cases, is a pair of long-handled "thistle tongs" for eradicating thistles from pastures more effectually, and certainly pleasantly, than if the unprotected hand were used for the purpose.

A large assortment of agricultural and horticultural tools from India, all of which have been in actual use, have been recently presented to the Society by L. H. Morgan, of Rochester. Thus the farm tools of the time of Jacob and Laban, are placed alongside those in common use among our New York farmers to-day, and while in the main we are thus led to see the march of improvement which through the long centuries has been made, we cannot fail to be surprised at finding in this lot of rude tools some contrivances for which patents have been granted at Washington within a few years. For instance, there is a pump made with a series of buckets on an endless rope, which to all intents is the same as the chain pump which we think such a remarkably clever Yankee invention; and in two of the grain and seed-drills the seed is dropped through tubes which pass through a shoe, the furrow is cleared for it, the seed is covered, and compactly imbedded exactly as our seed is now planted and covered by a score of "modern improvements" which are to be found at any of our large Fairs.

The Hindoo cultivator is, to our notion, a more philosophical tool in principle than our modern harrow; for, whereas the latter compresses the soil over which its wedge-shaped teeth travel, the barbarian's cultivator, while it loosens lifts the earth, and thus leaves it in as porous a state as previously. There is a great plow in this lot of tools meant for a team of twelve bullocks, which will plow, or rather root, to a depth of some eight inches, and which embraces that principle of the double arch which Professor Mapes counts as the great merit of his "soil-lifter." True, the sole of this Hindoo plow is of wood, and not less than five feet in length, and only its nose is shod with iron, but from nose to beam, and from center to sides of the sole, there is a definite although gradual arch, which is well calculated to lift the soil and throw it outward from the center.

We should be very loth to conclude our imperfect sketch without some complimentary notice of a beautiful suite of specimens of dried grasses and flowers, made by a farmer's wife in Rensselaer county. By some peculiar processes of desiccation, she preserves all the colors of the flowers in their original brilliancy, as well as retaining their shape. A large bou-

quet, and many single cards of flowers which had been in the cases for a twelvemonth, were apparently as fresh in color as on the day when they were picked. Another lady amateur botanist contributes a collection of 154 varieties of weeds, all of them collected, pressed, and correctly named by herself. And so, from case to case, and gallery to gallery, we might wander and find a host of things of more or less interest to our readers, but we trust we have said enough to convince our farmers that a day spent in the Museum at Albany, cannot fail to prove in a high degree profitable.

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RAVAGES OF INSECTS ON FOREST AND FRUIT TREES—REMEDY.

The trees in the parks and gardens of this city having been seriously affected by insects, we sent to Dr. Fitch some of the limbs affected; and the annexed answer gives the remedy for these depredators. J.

JUNE 27, 1860.

Hon. B. P. JOHNSON :

Dear Sir—The “depredator upon the trees in Albany—very extensive”—of which you send me specimens—is a species of scale insect. The oval brown scale is the dried remains of the body of the female, which, adhering to the bark, covers and protects her eggs during the winter. When the warmth of the advancing season is about hatching the eggs, a white cotton-like substance begins to grow among them underneath the scale and protrude from one of its ends, elevating it from the bark—this cotton serving to protect the tender young insects till they become sufficiently robust to endure a full exposure to the atmosphere. The newly hatched insects resemble exceedingly minute lice. Each of these little masses of white cotton which are adhering along the under sides (as I suppose) of the limbs, may now be seen, by the aid of a magnifying glass, to be thronged with these lice, or with eggs not yet hatched. After a while, the lice will forsake this covering and disperse themselves over the bark—particularly the smooth tender bark of the small limbs and twigs—nourishing themselves by puncturing it and sucking the sap therefrom.

All kinds of these scale insects are most pernicious to the trees or other vegetation on which they occur. The apple tree bark louse—the minute oyster shaped scale, so common on our apple trees—is the species with which we have had the most experience; and it is altogether probable that any remedy which is effectual for it, will be equally efficacious for all other scale insects, including this now on the Albany trees. In the Memoirs of the old Board of Agriculture of our State, vol. iii, pages 535–539, is copied from the Memoirs of the Caledonia Horticultural Society, an article by Sir G. S. Mackenzie, on anointing the bark of trees with oil, to destroy insects thereon, alluding particularly to the apple tree bark louse. And in Illinois and Wisconsin, where of late years this insect has been unprecedentedly fatal to their orchards, and where every remedy which could be thought of has been tried, with but indifferent if any success, it is now reported that smearing the bark with oil—the same measure so long ago

noticed by Mr. Mackenzie—has been found to be a sovereign cure for this malady. I doubt not but that by it many of your Albany trees may be saved, which will otherwise perish. Fish oil, or any other kind of oil or grease, thinly applied, everywhere over the bark, so that its glossiness, is merely perceptible, is all that is required.

Messrs. Ellwanger & Barry have also sent me specimens of this same insect, as being abundant upon the maples, especially the soft maples, at Rochester. It is, therefore, very common at this time, probably, over a large portion of our State. In former years, I have occasionally met with single specimens of this scale on the trees here, in Washington county. An insect of this same kind occurs upon the maple in Europe, and is named *Lecanium Aceris* by entomologists. The fullest account of this insect which I have seen is in Curtis's British Entomology, where it is stated that "a white, flowery-like matter, in which the minute young are to be observed," grows underneath the scales. As it is a fibrous, cotton-like matter, not at all pulverulent like flour, which our insect grows, I think it is a distinct species from that of Europe, and have, therefore, named it in my manuscripts, *Lecanium Acericorticis*, i. e. the maple bark scale insect.

Yours truly,

ASA FITCH.

CATTLE DISEASE IN MASSACHUSETTS.

NEW YORK STATE AGRICULTURAL SOCIETY :
STATE AGRICULTURAL ROOMS, }
EXECUTIVE MEETING, JUNE 21, 1860. }

Present—Benj. N. Huntington, President ; John Jay, Charles S. Wainwright, Herman Wendell, Francis M. Rotch, Vice-Presidents ; Samuel Thorne, L. Chandler Ball, Ezra Cornell, A. B. Dickinson, H. T. E. Foster, Executive Committee ; Luther H. Tucker, Treasurer ; B. P. Johnson, Secretary ; Hon. John P. Beekman, Columbia ; George Vail, Esq., Rensselaer ; Ezra P. Prentice, Esq., Albany ; Hon. Samuel Cheever, Saratoga ; Hon. Wm. T. McCoun, Queens ; T. S. Faxton, Esq., Oneida, Ex-Presidents.

His Excellency Gov. Morgan was present with the Executive Committee, on their invitation.

The Secretary, B. P. Johnson, who had made two visits to Massachusetts (in the last he was accompanied by Luther H. Tucker, Treasurer, and Prof. Chas. H. Porter, chemist of the Society), to examine into the cattle disease there prevailing, and ascertain, as far as practicable, the peculiarities of the disease, and the best probable means of arresting it, submitted to the Board his report :

REPORT TO THE EXECUTIVE COMMITTEE OF THE STATE AGRICULTURAL SOCIETY.

The cattle disease prevailing in Massachusetts has excited much interest in our own State, and frequent letters having been received at the Agricultural Rooms, urging attention to it on the part of the State and the Society, the Secretary, with the concurrence of the President and other members of the Executive Committee, visited Boston on the 7th of June.

We arrived at Boston Thursday P. M., 7th June ; and had an interview with the Commissioners, Messrs. Lathrop and Walker, and with Mr. Sewall, member of the Board of Agriculture, and Mr. Flint, the Secretary, and every information possessed by them was most freely communicated. The Legislature was in session, and the laws introduced to arrest, if possible, this disease, had passed the Senate, and were under consideration in the House, and subsequently passed.

We met there, Commissioners from Maine, Ohio, Rhode Island, Kentucky, and Illinois. We have been furnished with a copy of the report made by S. L. Goodale, A. Nourse, and E. Holmes, Commissioners of Maine, who had been there some days previous to our arrival, and had full opportunities for making a thorough examination, and give the following

extracts from their report, as furnishing a full and correct history of the disease to the present time :

The Commissioners report :

" That we find the disease called Pleuro-Pneumonia, (or malignant inflammation of the pleura and lungs, of France vide Dr. Copeman's article annexed), existing in some of the herds of Massachusetts; that it was introduced thither by means of cattle imported from Holland by Winthrop W. Chenery, Esq., of Belmont, and which arrived on the 29th of May, 1859. Two of the four animals thus imported died soon after arrival; one was noticed to be ill about the 20th of June, and died in nine days after; the fourth is yet living. Some time in August another cow in Mr. C.'s herd became sick, and died in about a fortnight; and in the course of the two subsequent months he lost about thirty head of cattle by the disease. Veterinary surgeons were called in from time to time, and the mortality was, at first, ascribed to want of proper ventilation, which was, undoubtedly, a serious cause of aggravation; but the true nature of the disease was not discovered until November, when Dr. E. F. Thayer, a skillful veterinary surgeon, on visiting the herd, at once unhesitatingly pronounced it to be the disease known in Europe as Pleuro-Pneumonia.

" Mr. Chenery's farm is so situated that very little communication has existed between his cattle and those of others; but on the 29th of June—the very day on which the cow died which Mr. Chenery believes to have been the first victim of the disease (the death of the two first he ascribes to injuries sustained during the voyage)—he sold three Dutch calves to Curtis Stoddard, a young farmer of North Brookfield. On their way thither in the cars, one was noticed to falter, and soon it became quite ill, and Mr. Leonard Stoddard, father of Curtis, took the calf home with him, to care for it, and placed it in a barn in which he kept forty head of cattle. It grew worse, and in a few days the son took it back, and in about ten days it died. In about a fortnight the disease appeared in the herd of Leonard Stoddard, and one after another of his animals sickened and died. In November—and for reasons independent of the disease—young Stoddard sold the larger portion of his herd, reserving nine of the most valuable animals. This sale scattered eleven in various directions, which carried the infection *wherever they went*; and one of them is said to have infected more than two hundred others. Without a single failure, the disease followed these cattle.

" A yoke of oxen, from the herd of Leonard Stoddard, was employed in a team of twenty-three yokes, gathered from various quarters, to move a building from Oakham to North Brookfield. One pair of these oxen has, since then, so changed owners that it has not been traced, and nothing is known of its fate; *but in every other instance it is known that the animals took the disease.*

" Without dwelling upon numerous other cases, in which contagion can be traced with equal distinctness, it is sufficient to say, that no case is known to have occurred where communication with diseased cattle cannot

be traced ; and it is believed that no where in Europe has there been an opportunity of obtaining so convincing evidence of its contagious nature as in Massachusetts.

"As with all other contagious diseases, both among men and brutes, some individuals are found to be less susceptible to the contagious influence than others, and some are not affected by it at all ; and doubts have arisen in the minds of several European writers on this point, the weight of opinion being, however, very strongly in favor of its contagious nature ; but we submit that the facts in Massachusetts are such as *to prove it beyond a reasonable doubt*. We find the disease to be not only contagious, but insidious and deceptive, malignant and fatal. *Insidious*, inasmuch as it often creeps upon an animal so stealthily that it is difficult and impossible to fix, with any accuracy, the date of the attack. *Deceptive*, in that, in animals which have had the disease, and may be fairly presumed, *from appearances*, to have recovered, one or both lungs have been found, on slaughtering them, to be little else than a mass of disease.

"That it is both malignant and fatal, unhappily needs no proof. Nearly one thousand animals have already fallen victims, either to the disease, or to efforts made with a view to its extirpation, and more than an additional thousand are either known to be sick, or from having been exposed are under the ban of suspicion. It is not true, that the distemper is universally fatal, for not a few survive which have been its subjects ; but it is not yet positively known that even *one* has been absolutely *cured*. They often come to eat well, drink well, and thrive tolerably—thus exhibiting the ordinary characteristics of health, and yet, a post mortem examination has, within our own observation, shown how utterly fallacious were all these indications in such a case.

"Regarding the term of incubation and of propagation, or the length of time which elapses between exposure and the appearance of disease ; and also during what period the animal is capable of conveying the disease to others, we greatly regret our inability to arrive at definite or satisfactory conclusions. In some cases the disease is apparent within ten days after exposure ; in others, twenty, thirty, sixty, ninety days, or even more, are supposed to elapse. One case is reported where the exposure was seven months previous. The more usual period appears to be not far from twenty days. When the capability of the animal to convey disease to others begins or ends, we have no knowledge. This is a most important point, but all we *know* is, that it may, and does do so before any symptoms of illness appear ; and, as the lungs of some which have been slaughtered exhibit evidence of the later stages of the disease in one portion, and of the earlier in another, there seems reason to fear that the term may sometimes be indefinitely prolonged. * * * * *

"Any disturbance of the animal's health is rarely noticed until the disease is fully established, and effusion into the chest has made some progress. The ordinary rule, that not much ails an animal until it refuses to eat, does not hold good with this disease.

"**SYMPTOMS OF THE DISEASE.**—The early symptoms are so obscure and faint as to excite neither anxiety nor attention. Gradually the beast gets a dull and dejected look; if at pasture, it may be found in the morning apart from the herd, the back arched, the fore legs rather wide apart, the hair *staring*, a little uneasy, and don't eat well; but later in the day it looks better, joins the herd and eats as usual. A slight but *husky* cough is occasionally heard, followed by quicker breathing, as if from extra exertion. If a cow, the milk diminishes, accompanied with heat and tenderness of the udder.

"As the disease progresses, the eyes look duller, the head is lowered, the nose protruded, the cough more frequent and husky, the appetite lessens, rumination is suspended, the limbs and surface cold, the skin tight over the ribs, the spine becomes tender, and pressure upon it, or between the ribs, produces evident pain. (The bowels constipated, the *fæces* almost black, and quite hard.) As the disease approaches an unfavorable termination, the breathing becomes fearfully laborious, and is accompanied with moans, and sometimes with grunt; the eyes sink and extremities cold, the mouth is covered with froth, the strength fails, and the poor beast falls and dies; or, if the animal is to recover, the severity of the symptoms abate, it looks better, eats some—if a cow, the milk returns, the hair becomes sleek, &c.

"Percussion and auscultation furnish the most reliable means of judging, in the living animal, of the state of the disease. Upon striking with the ends of the fingers upon the affected side, a dull sound is usually elicited, proportionate to the consolidation of the lungs, or to the presence or absence of fluid in the cavity of the chest. Upon applying the ear to the sides of the chest, one or the other, and sometimes, though rarely, both are found to be affected. The various sounds cannot be easily or exactly described, but a practised ear will judge with great accuracy between the natural murmur of healthy lungs, and the different sounds recognized in the several stages of the disease.

"In what manner, and through what channel the disease enters the system—whether it makes its attack directly upon the solids, or begins by corrupting the blood—these, and other kindred points, are at present matters of pure conjecture.

"With regard to the treatment, little of a satisfactory character can be offered. The severity or the mildness of the attack, and its termination, whether favorable or fatal, may, not improbably, depend more upon the susceptibility of the individual, and upon the amount or intensity of the contagion taken into the system, than upon any treatment bestowed.

"Whether subjected to a course of medication, or trusted wholly to the recuperative powers of nature, some will recover in whole or in part, but we have little reason to believe that any will so recover as to be secure from a second attack, or become *able bodied and sound, or valuable for the ordinary purposes for which domestic animals are kept*. Considering the probable unsoundness of those which survive, bearing also in mind the

exceeding importance of active and healthy lungs, and the expense necessarily involved in the treatment and isolation of those which are lost, as well as those which are saved, the conviction is forced upon us, that attempts to cure this disease will rarely, if ever, pay. We may remark, however, that COUNTER IRRITATION, by diverting diseased action from the vital organs to the surface, promises beneficial results, and the application of highly stimulating liniments, blisters, setons, and the like, is understood to have been of more service than aught else.

"The appearances after death vary greatly, but there are usually extensive adhesions; consolidation of a portion of the lung tissue marked by a *peculiar marbled appearance*, is one of the most striking and uniform accompaniments of this disease. In some cases an immense cavity is found in one of the lungs, and, enclosed in that cavity or cyst, a cheesy substance or lump, having no attachment to, or connection with, the adjacent lung. In others, the process of detachment had not been fully completed. Some lungs were found to be so hypertrophied as to weigh three or four times as much as in health, and in one the estimated weight was from fifty to sixty pounds."

We visited Mr. Chenery's establishment, and examined his herd. The animals were in commodious and well ventilated stables, and every desirable care and attention given to them. Some of them are diseased; they are so arranged that no communication can be had with other cattle. There were no animals killed while we were at Boston, at this time, but we examined the diseased lungs of several animals slaughtered, which have been preserved by the commissioners, and give satisfactory evidence as to the *peculiar* as well as virulent character of the disease.

We returned on Saturday evening of the 9th. Previous to leaving Boston, we received a notice from Hon. Amasa Walker, one of the commissioners, that on Tuesday, the 12th, two or more animals would be examined at Brookfield, and some diseased ones would be killed, and inviting us, with commissioners from other States, to be present. On Monday we called on Governor Morgan, and consulted with him as to what was best to be done. He advised that we should go with some professional gentlemen and attend this examination, and Prof. Porter, Chemist of the Society, and L. H. Tucker, Esq., Treasurer, went with us to Brookfield. We endeavored, at the request of Gov. Morgan, to secure the attendance of some other medical gentlemen also from the city, but owing to the short notice we were able to give, we did not find any one that could go.

We arrived at Brookfield on the morning of the 12th, and met Hon. Amasa Walker, and Hon. Paoli Lathrop, commissioners, Rev. Mr. Sewall, member of the Board of Agriculture of Massachusetts, Dr. Thayer, veterinary surgeon, who has been employed by the commissioners, and appears to be well posted in regard to the disease, Dr. Ellis, a very intelligent physician, of Boston, Hon. E. R. Potter, commissioner from Rhode Island, Dr. Klippart, Secretary of the Ohio Board of Agriculture, and Dr. Thomp-

son, of Ohio, commissioners from Ohio; Dr. Bemis, Louisville, Ky., and Dr. McClelland, from Illinois.

We proceeded to the town farm of the town of New Braintree, (adjoining N. Brookfield, where the disease first manifested itself.) The herd of cows and other animals here, some of them diseased, and some had previously been killed from this herd. The herd was kept separate from other cattle, and was under the direction of the commissioners. The cattle were driven from the pastures to the stables, and were examined. Several of them were pronounced on examination to be diseased, although in a less virulent form, we were told, than when last examined. The dairy cows were in milk, and although not giving the usual quantity generally, yet were all giving milk.

Two of the animals were selected and killed. One of these proved to be diseased, though in the earlier stages of the disease. The other was apparently healthy. The disease, it is said, was communicated to this herd from cattle which had the disease at Mr. Stoddard's, in North Brookfield, or which took the disease from his herd.

Prof. Porter, and Mr. Tucker left after the examination of this herd. We remained and were present at the examination of a yearling steer, belonging to a Mr. Wood, whose farm adjoins Mr. Stoddard's in North Brookfield. This animal had been sickly since last December, and on examination, was pronounced diseased. On killing, the examination showed a clear case of disease—"Pleura-Pneumonia," and was, we believe, entirely satisfactory to all present. We brought a piece of the diseased lung, which was delivered to Prof. Porter for examination.

From all we could learn we were led to believe, that if in the commencement or first appearance of the disease, the cattle affected and those exposed are entirely *separated from others*, and *remain so*, under proper treatment, in clean, well-ventilated stables, or in pasture, until all symptoms of the disease are eradicated, or the animals slaughtered and buried, that the disease may be arrested, as it has been frequently in England, Australia, Europe, and in this country.

That the disease is contagious and under certain circumstances infectious, seems from the evidence to be established. We have seen no evidence that the disease is propagated in any way but by contagion or infection. There are, however, those who believe differently; but in Massachusetts, where the disease has been most prevalent, we think the opinion is nearly universal that the disease is contagious.

Admitting that *isolation* of the infected cattle will stop the spread of the disease, it seems probable, (that, if the Massachusetts laws are promptly and rigidly enforced, as it is believed they will be,) the disease will not hereafter cross the Connecticut river. So far as we are able learn, there is no satisfactory evidence before the commissioners, of any animal diseased passing *west of the Connecticut river in Massachusetts*. We hope this may prove to be so, as it greatly lessens the probability of the disease reaching our State from that direction.

Every precaution should be taken to prevent the introduction of cattle from diseased localities in our State. It seems important, in order that we should be prepared to act understandingly, that a committee should be selected, one, at least, of whom should be a medical and scientific man, to visit Massachusetts, examine the diseased animals, and into the nature of the disease, as there developed, so as to be prepared to decide, when called upon, whether it is probable an animal has this disease or not. It is evident, from what we saw in Massachusetts, that those gentlemen who have been engaged in the examination of the diseased cattle in Massachusetts, very seldom are mistaken as to the animals having this disease, on their first examination. We are convinced that, if competent men can have the opportunity of attending the examination of diseased animals, and those which are slaughtered, and learn the manner in which the disease usually manifests itself, and also the means best adapted to arrest its progress, as proved by experience, that we shall be in a situation to act understandingly upon the subject, and be prepared thus far, at least, to aid in arresting its progress should it appear among the cattle of our own State.

We are inclined to the opinion, that in most cases, but few, comparatively, will be restored to usefulness, and that the isolation of infected and exposed animals, and the killing of the diseased ones, is the surest way of arresting the disease.

From what we learned at Boston, from those engaged in the treatment and management of the disease, it is apparent that very much unnecessary alarm has been caused out of the State by reports circulated of the disease appearing in other localities. The confidence with which it has been asserted in many instances that a disease *identical with that in Massachusetts*, has broken out, has spread far and wide the alarm, and yet in many cases on examination, it has been satisfactorily ascertained that the disease is entirely different, and not contagious in its character.

At the same time it may be proper to note that, according to evidence too full and well substantiated to be rejected, *Pleuro-Pneumonia has in several instances made its appearance in this country previous to its introduction by Mr. Chenery's importations*. Cases in past years in the vicinity of several of our cities, of its attacks and subsequent entire extirpation, have been brought to our notice in detail, in regard to which the weight of testimony is satisfactorily corroborative of the experience elicited in the Massachusetts investigations—tending throughout to establish the conclusions already intimated, namely, that this disease is contagious rather than essentially epidemic in its character, and that the means of its suppression by the isolation of affected or suspected stock are within the reach of all. That, consequently, any general alarm or “panic” here or at the south and west, has no cause or foundation in any facts yet brought to light, and indeed, that the actual spread of the complaint in the infected districts is scarcely as great as might be inferred from the prominence the subject has

now acquired through the newspapers and before the public authorities. Out of the whole number of cattle reported upon by the Massachusetts commissioners, we find that they had killed,

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They do not report the whole number supposed to have died by the disease itself; the commissioners from Maine, however, say, in the extracts above given, that "nearly one thousand animals have already fallen victims *either to the disease, or to efforts made with a view to its extirpation,*" and even without deducting the exposed but still healthy animals killed as above, the "ravages of this formidable plague assume considerably less proportions." The other "thousand" referred to in the quotations from the Maine report, includes, as the Massachusetts commissioners expressly stated, all "animals diseased, *exposed or suspected,*" and when we consider that as many as four or five thousand head of cattle sometimes change hands at the Albany cattle market in a single day, it will be seen that the loss already sustained or anticipated—although sufficiently heavy—is by no means of such extent as might be supposed from the rumors which have gained ground in other States. That these losses, even, might have been nipped in the bud, if the proper measures had been known and promptly taken, the commissioners themselves assure us; and now that the disease has been suffered to spread over the area at present infected, we owe our acknowledgments to Massachusetts for the laws and appropriations she has just so generously passed, and which seem quite sufficient to obviate the most remote danger of the extension of the Pleuro-Pneumonia into any other part of the country, or into her own counties west of the Connecticut river.

B. P. JOHNSON.

After the reading of the report, and a full consideration of the facts embodied in it, Mr. John Jay, of Westchester; E. P. Prentice, Esq., Albany; Francis M. Rotch, of Otsego; and Luther H. Tucker, Albany, were appointed a committee to prepare a series of resolutions, and to recommend such precautionary action as may be deemed wise and effective to guard against the approach and effects of the disease.

Mr. Jay, from the committee, reported the following resolutions, which were adopted and ordered published, with the report of the Secretary:

RESOLUTIONS.

Whereas, An unnecessary alarm is believed at present to prevail in relation to the probable spread of the Pleuro-Pneumonia now existing in Massachusetts; and *whereas*, other milder and more common complaints are likely to be mistaken for it; and *whereas*, the symptoms of the disease are not only distinctly marked, but very plainly pointed out in the report

received from the committee of the Society, who have recently visited the infected districts; therefore

I. *Resolved*, That in view of the highly contagious character of the Pleuro-Pneumonia, the chief and perhaps the only safety for the farmer in case of suspicion, lies in the isolation of his cattle as completely as possible from all contact with each other and with those of his neighbors.

II. That by the adoption of this course there are within the reach of every farmer, the means of restraining the Pleuro-Pneumonia should it appear within the limits of his own herd; and that, for the information of the farmers of this State in regard to the disease, the report be printed for general circulation.

III. That the President and Secretary be a committee to designate one or more persons practically conversant with the Pleuro-Pneumonia, who may be consulted in case of suspicion in any part of the State, at the expense of the parties applying for such assistance, to dispel the suspicion at once if it proves to be unfounded, and to recommend the proper precautions and remedies if any case of the disease in question should actually be found to exist.

IV. That we warmly appreciate the disinterested efforts made by the State of Massachusetts to prevent the extension of this disease to other States; and that the thanks of the New York State Agricultural Society are hereby returned to the authorities of that commonwealth, and that a copy of these resolutions be addressed by the Secretary to his Excellency the Governor of Massachusetts.

B. P. JOHNSON, *Secretary*.

STATE AGRICULTURAL ROOMS, }
Albany, June 21, 1860. }

We give the annexed remarks from Dr. A. S. Copeman, Veterinary Surgeon of Utica, who has been selected by the President and Secretary of the State Society, to whom reference may be made, should the disease appear in our State. It will be seen from the remarks of Dr. Copeman, that he is entirely familiar with the disease, and we have the most abundant evidence of his competency.

PLEURO-PNEUMONIA IN CATTLE.

This disease, which prevails at this time in the State of Massachusetts, is the pulmonary epizootic of the German authors; the peripneumonia of the Belgians and Italians, the malignant inflammation of the pleura and lungs of the French, and the pleuro-pneumonia of the English.

This contagious malady of the bovine race is probably of ancient date, but it has never been carefully studied until the last and present century. In 1733 it was especially observed in the Cantons of Zurich, in Switzerland. In 1765, Bourgelat carefully studied it in Champagne. It prevailed at the same time in Permont, Jura, Dauphin, Bourbonnais, and in the environs of Paris.

Its outbreak has, in almost every instance, been marked as coinciding with the change of cattle, resulting from commercial importations. It is in this manner that its presence may be accounted for in the North in 1822, in Holland in 1833, in Belgium in 1837, and in England in 1842.

From official reports we learn that Holland remained exempt from this malady up to 1832. The ravages then committed by it in the provinces of Gueldre, Dutch Brabant, and Zealand, were such that the government prohibited the exportation of cattle. It first broke out in the province of Gueldre, to which it confined itself for two years. In the beginning of 1836, it reached Southern Holland, where it spread with great rapidity. In 1837 it prevailed in more than one hundred villages in the last named province, and in the same year about 7,000 head of cattle were carried off by it. In Holland, as in Belgium, this fatal disease still continues its ravages, but with far less intensity.

The symptoms of pleuro-pneumonia, may be distinguished by three stages, viz., the commencement, progress, and termination. We have adopted this method to render our description as simple as possible, for, in reality, the several stages of the disease become more or less complicated, and it is impossible to assign to them precise limits. *Commencement*—this is difficult, even to the veterinary surgeon, to detect and characterize. It almost always escapes the observation of the proprietor—the ordinary attendants very rarely discover the disease until it has existed from one to several weeks. The cough is the symptom the most easy to detect, and is that which first attracts the owner's attention. It is dry, weak, and involuntary, and generally arrests rumination for one or two minutes. The symptoms of the second stage are easy to recognize—the cough is troublesome, the respiration is hurried, especially when the animals have been exposed to cold or wet, the appetite is sensibly diminished, and rumination is irregular. Pressure upon the ribs may produce pain, and each movement of the animal is accompanied by a moan or grunt. The pulse is feeble, but more or less accelerated, mouth hot, muzzle often dry, membranes of the eye paler than natural. As the disease advances, the ears and base of the horns are alternately hot and cold, the skin inelastic, and the coat is staring; the animal is dull and dispirited; breathes hurriedly on undergoing the slightest exertion; the cough is persistent, breathing heavy, coat dry, and covered with dandriff, great and general emaciation, all indicating the existence of chronic disease in the lungs.

Many able veterinarians have given this disease their best attention, and the symptoms, progress, and pathological anatomy of it have been described with great accuracy. The nature of this malady has also awakened much discussion, especially on the all-important question of its being contagious or not. The great majority contend for its being so. If in some cases the disease has not been transmitted from a diseased animal to a healthy one—this is not a sufficient reason to place it among the non-contagious diseases, particularly when existing facts seem to prove the contrary. Pathology teaches that it is necessary for an individual to receive

the impression of a virus, either fixed or volatile; that the organism must be predisposed to this impression, but this predisposition may not exist in some individuals. These facts constitute the exception, and not the rule, of which every contagious disease offers examples. Those who have watched this disease have agreed that it spares neither age, sex, nor constitution; that it attracts the strongest as well as the most debilitated animals; that it has prevailed in localities which possessed all the requisites to health, as well as in those which, being low, were damp and unhealthy; in conditions of the atmosphere the most opposed to each other; also, whether the food given were dry or ground, or the cattle were kept in stables or in pastures; and all these circumstances have been also impotent in checking its progress. One might almost conclude from this that pleuro-pneumonia possesses an independent cause and is contagious.

We, however, possess no positive fact, no unobjectionable experiment by which to establish the contagious nature of the disease. When we look for instances of contagion, we do not meet with them only in certain localities, but wheresoever the disease has prevailed. In analyzing facts, we never find the disease spreading itself suddenly in a herd, but generally attacking one or two individuals, and almost always those which have been recently bought and introduced into the herds. After a short time the number of cases increase, and then gradually diminish, disappearing only when all or nearly all the cattle have contracted the malady. When the system of stabling the cattle is adopted, the first animal attacked often communicates the disease to the two nearest on the right and left, and this may go on until all are infected, unless the place is badly ventilated, in which case the infected atmosphere takes a wider range, and acts indiscriminately on all the animals. This slow progress, owing probably to the virus being but slightly volatile, explains the cause of the existence of the disease in some localities for several months and even for years.

Finally, the possibility of checking the progress of the disease by a well observed separation, when taken in time, is also in favor of contagion, for when the diseased animals are removed from the healthy ones, the disease is speedily checked, and confines itself to the destruction of a few individuals only. In every country where pleuro-pneumonia has existed, numerous instances of the disease, arising from contagion, have been witnessed, and we are *fully convinced that contagion is the alone cause of the disease*—that those contract it which have been in immediate contact with affected animals, either in the stables, at grass, or at the watering troughs.

We have had frequent opportunities of observing, that the disease has been confined to a few farms, and even to a few individuals, when the separation was strictly adhered to. Convalescent animals can likewise propagate the disease by contagion. We have observed its extending in this manner in many instances where no other cause could be discovered; this fact is fully confirmed by Delafind, Gerlach, Erust, Verneyeu, Barlow and Simmonds. M. Delafind observes, "pleuro-pneumonia has for the last ten years extended itself to the plains and the pastures. Its extension by con-

tagion, however slow, goes on increasing. It prevails now in all localities when the mutatum of animals is frequent, either for the advantage of fattening, the secretion of milk, or otherwise. In districts where breeding is the object, and consequently changes are rare, cattle have remained free from this disease." This important observation furnishes us with a strong proof of contagion. It is a well known fact that in Flanders the disease committed the greatest devastations. There is hardly a village where it has not made its victims, with one exception, however. In a communication from M. Vanaken, he says: "On the left bank of the Escauk, there is a hamlet on the outskirts of the town of Fermonde, containing about twenty farms, where the importation of cattle is of rare occurrence, but where all the predisposing causes, such as narrow, low and ill-ventilated stables, acrimonious and sour provender, want of litter, and frequent inundations exist, notwithstanding which there has not appeared the least trace of pleuro-pneumonia, while it has committed sad ravages in all the adjacent villages." This fact adds fresh strength to its being contagious.

When pleuro-pneumonia first broke out in Holland, Vanispen, President of the Committee of Agriculture, instituted an inquiry with a view to ascertain the origin of the disease, Public rumors accused Vanderbosh, a distiller, of having bought some oxen that were taken out of the pastures in the Prussian territory, on the frontiers of Holland, where a great many cattle had fallen victims to the disease.

The inquiry confirmed the fact of the importation of the oxen, and also the first appearance of the disease in his stable.

At the Veterinary Congress, held at Mayence, in 1841, the question of contagion was agitated. All the members, twenty-three in number, were in favor of its being so. They admitted, moreover, that at an advanced period of the disease, it was not only transmitted by immediate, but by mediate contact, that the expired air and the mucus from the branchi are the principal vehicles of the contagious virus; that the infected atmosphere would not only spread it in the same stable, but would also penetrate into the neighboring stables, when not so far removed, that the virus adheres to contagious bodies, by which the seeds of the infection are carried from stable to stable. Its progress is at first slow, and the period of its development is of an indeterminate period; it may be several weeks.

We will contend that pleuro-pneumonia has not developed itself spontaneously in Massachusetts or any other part of this Continent; but it is also certain that none of the causes which have been assigned as giving birth to this disease will bear close investigation. That pleuro-pneumonia is contagious daily observation affords the strongest proof—the Legislature of Massachusetts evidently considers it such, in consequence of which it has assigned an indemnity to those whose cattle are slaughtered after the proper authorities have examined them, so as to prevent the spreading of the disease. But to what purpose is this partial slaughtering, if no barriers are opposed to the propagation of the infection? If the virus which gives birth to the disease be not destroyed, some diseased animals at great ex-

pense are destroyed, it is true, but we fear the principle of the evil is left untouched, and what is more, every individual is at liberty to propagate the disease, since no penalty is inflicted on those who sell cattle which are suspected. As soon as the disease prevails in a herd, and has committed some ravages, the proprietor disposes of the remainder to his neighbors, thereby spreading the disease in all directions.

Being altogether ignorant of the causes which engender pleuro-pneumonia, we will regard it as a contagious disease *a priori*; that is, a disease which has been introduced from without, which exists, and maintains itself only by or through contagion; it is under this impression that we will examine those sanitary measures which are applicable to it.

1st. Every proprietor of cattle as soon as the disease shall appear among his herd, shall, without delay, inform the "Sanitary Commissioners" of the fact; this to be an indispensable condition to obtain the indemnity from the Legislature.

2d. The moment the disease has shown itself in a stable, said Commissioners shall take every precaution for the perfect sequestration of the diseased animals from those which are as yet healthy, and see that they are not attended by the same individuals. That localities where they have sojourned, and the remaining animals which we have designated as healthy, must be considered as infected, and consequently they must be prohibited from passing the limits of their domain, for at least eight weeks after the death or cure of the last case.

3d. It would be of the greatest utility to induce the proprietors of cattle to submit to a *quarantine* of eight weeks before letting their cattle freely communicate with each other, in particular those which have been recently bought.

These measures are neither complicated nor difficult of execution; they only require a will to enforce them, and we are confident they would be crowned with success. There remains one question to be noticed: What is to be done with the diseased animals that have been sequestered? Are they to be placed under treatment, or slaughtered immediately on the appearance of the first symptoms? We know all the objections that have been raised against systematic slaughtering. Still, in our opinion, the means most advantageous to the interests of the State, and also the proprietor, would be to slaughter all cattle which exhibit the *characteristic symptoms* of the disease. This would be more efficacious than partial slaughtering and the allowing of free communication, without control of the infected animals with each other. If we take a retrospective view of the different modes of treatment that have been advocated for pleuro-pneumonia, and considering the little success, or rather non-success, by which they have been attended, one must acknowledge that we are but little advanced in the therapeutics of this disease. The periods of development are generally long. Already extensive, deep, and from their nature incurable lesions exist in organs most essential to life, and that before the system becomes excited, so that it may almost be considered passive;

indeed, the *genus bovis* will, for a long time, resist the influence of a disease which tends to *destroy* the very source of existence.

Thus, to the common observer, suspected cattle exhibiting externally all the signs of perfect health, and inspiring them with the greatest security, may offer very little chance of cure to the veterinary surgeon who explores the organs of respiration attentively. The proprietors consult the veterinary surgeon only when morbid phenomena indicate that their cattle are really suffering from the effects of a specific poison," and what can then be done beyond "symptomatic treatment?" A return to health is in some cases affected, but a radical cure seldom. Still this apparent return to health is often only the passing from the *acute* to the *chronic* form of the disease. The animal sustains an organic lesion of a serious nature; it remains in a state of emaciation, or is unthrifty; marasmus supervenes, and pulmonary phthisis at length puts an end to its miserable existence. In this case it is a loss rather than a source of profit to the proprietor; and it is not certain whether, even in this stage the animal does not possess the power of disengaging the principle of contagion, and thus infect other animals.

We consider this the most efficacious measure, and by adopting it we should only imitate that which is practised in some of the German States.

In closing, we beg to refer those desirous of studying pleuro-pneumonia to the contents of our Essay upon this disease, by the author, published in 1845, in the 18th vol. of the London "Veterinarian."

ARTHUR S. COPEMAN.

UTICA, N. Y.

☞ *Veterinary Surgeons* appointed by the *President* and *Secretary*, under the 3d Resolution, (ante p. 785,) for consultation, should suspicion of the disease exist in any part of the State,

Dr. ARTHUR S. COPEMAN, V. S., Utica.

Dr. H. MOORE, V. S., Poughkeepsie.

These gentlemen are familiar with the disease as it has prevailed in Great Britain, and are well known in this State as distinguished in their profession.

ERRATA.

Page 158—Tile drains, T. C. Maxwell & Brother, 2d premium.

W. T. & E. Smith, 1st premium instead of 2d.

Page 495, 32d line—"Dry season" instead of "cold."

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